THE FISHES
OF THE
INDO-AUSTRALIAN ARCHIPELAGO

X

TUTA SUB AEGIDE PALLAS
EJB

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS

LIBRARY
BUREAU OF COMMERCIAL FISHERIES
U. S. FISH AND WILDLIFE SERVICE
P. O. BOX 3830
HONOLULU 12, HAWAII

Digitized by the Internet Archive
in 2025

https://archive.org/details/fishery-bulletin_1953_10

THE FISHES

OF THE

INDO-AUSTRALIAN ARCHIPELAGO

THE FISHES

OF THE

INDO-AUSTRALIAN ARCHIPELAGO

BY

Prof. Dr. MAX WEBER† and Prof. Dr. L. F. DE BEAUFORT

X

GOBIOIDEA

with 95 illustrations

BY

Dr. F. P. KOUMANS

LEIDEN
E. J. BRILL
1953

QL 623.1
W4
V.10
c.2
1208⁶⁰

Copyright 1953 by E. J. Brill, Leiden
All rights reserved including the right to translate or to reproduce this book or parts thereof in any form

PRINTED IN THE NETHERLANDS

INTRODUCTION

In the introduction of Vol. VIII of this series it has already been mentioned that even during the life of the late Professor MAX WEBER we secured the collaboration of Dr. F. P. KOUMANS, who has specialized in Gobiids, to write the volume on the Indo-Australian species of this difficult order. Dr. KOUMANS observes:

"This volume contains the Order Gobioidea. During the preparation of the manuscript I had great help of the system of labels on the genera and species of this group, which system was kindly sent to me by the late Prof. Dr. MAX WEBER. Besides this Prof. WEBER and Prof. Dr. L. F. DE BEAUFORT helped me with literature and the lastnamed allowed me to study the whole material of the Zoological Museum at Amsterdam, both the identified and the not yet identified specimens. For this indispensable help, my sincere thanks are expressed. The study of the collection of Gobioidea of the Rijksmuseum van Natuurlijke Historie at Leiden, which contains the types and specimens of BLEEKER's collection, was made possible by the courtesy of the late Prof. Dr. E. D. VAN OORT and the present director Prof. Dr. H. BOSCHMA; to these gentlemen we wish to express our gratitude for their help and consent to use both the collection and literature of the institution.

"In preparing this volume the work of A. W. HERRE on Philippine Gobies was of great help to me, as was the fact with the manuscript by BLEEKER for the Atlas Ichthyologique. This manuscript is in possession of the Rijksmuseum van Natuurlijke Historie at Leiden.

"During a visit to several institutions, which was enabled by a grant of the Pieter Langerhuizen Lambertuszoon Foundation, I had the opportunity to study a large number of types and specimens of Indo-Pacific Gobioidea. The results of this study were published in Zoologische Mededeelingen, Leiden, vol. 22, 1940, p. 121-210. This trip and a few short ones to London, Paris and Bern, made it possible to recognize a number of described species as synonyms of already described species, or to enlarge the descriptions.

"My sincere thanks are due to Dr. S. L. HORA of the Indian Museum, Calcutta, who sent me the whole collection of Gobioidea of this Museum for study. The results of this interesting collection and other smaller collections from India have been published in Gobioid Fishes of India, Memoirs Indian Museum, Calcutta, vol. 13 part 3, 1941, p. 205-329.

"I am very obliged to the following Directors of Institutions and members of their staff, who helped me in every way in the study of the specimens under their care:

"J. T. Nichols of the American Museum of Natural History, New York, the late Dr. H. M. Smith and Dr. L. P. Schultz of the U.S. National Museum, Washington D.C., I. Ginsburg of the Bureau of Fisheries, Washington, D.C., H. W. Fowler of the Academy of Natural Sciences, Philadelphia, Dr. H. Bigelow of the Museum of Comparative Zoology at Harvard College, Cambridge Mass., Prof. Carl L. Hubbs of the Museum of Zoology, Ann Arbor, Mich., A. C. Weed of the Field Museum of Natural History, Chicago, Prof. G. S. Myers and Dr. A. W. Herre of Stanford University, E. H. Bryan of the Bernice P. Bishop Museum, Honolulu, G. P. Whitley of the Australian Museum, Sydney, Prof. W. J. Dakin of the University of Sydney, G. Mack of the National Museum, Melbourne, H. M. Hale of the South Australian Museum, Adelaide, T. C. Marshall of the Queensland Museum, Brisbane, Dr. J. D. F. Hardenberg of the former Laboratorium voor het Onderzoek der Zee, Batavia, the late C. P. J. de Haas, Tjikadjang, Dr. H. A. Roxas and Dr. D. Villadolid of the Bureau of Science, Manila, M. W. T. Tweedie of the Raffles Museum, Singapore, F. H. Gravely of the Museum, Madras, the late J. R. Norman of the British Museum (N.H.), London, the late Prof. Dr. J. Pellegrin of the Muséum National d'Histoire Naturelle, Paris, the late H. Blegvad of the Danish Biological Station, Copenhagen, S. Y. Lin of the Provincial Fisheries Experiment Station, Tinhai, C. B. Mainland of the University of Honolulu.

"The measurements are taken in the same way as was done in the preceding volumes. Only there are a few deviations in counting the scales. As the Gobioidea have no lateral line with sensory organs, the number of scales in a longitudinal line, named in the same way L.l., is counted between the upper corner of the opercle and the base of the caudal fin. The transversal line (L.tr.) is taken from the origin of the second dorsal fin, or the soft part of the united dorsal fins, vertically downward. In some groups two transversal series, L.tr. 1 and L.tr. 2, are indicated. In this case, the L.tr. 1 is counted from the origin of the second dorsal fin downward, L.tr. 2 from the end of the second dorsal fin downward. The predorsal scales are counted in the median line from the origin of the first dorsal fin forward as far as they exist. In a few cases (e.g. in Oxyeleotris), where the size of the scales in the dorsal median line between and before the eyes is much smaller, the number of these smaller scales is added between parentheses.

"The figures of this volume are again executed by Mr. J. F. OBBES. Only a few figures are of other origin, this is indicated below the figure."

Amersfoort L. F. DE BEAUFORT

March, 1952

SYSTEMATIC INDEX

page

Order GOBIOIDEA 1

1. Fam. Gobiidae 2
  1. Subfam. Gobiodontinae . 2
    1. *Paragobiodon* Bleeker . . 3
      1. echinocephalus (Rüpp.) 3
    2. *Gobiodon* Bleeker . . . 5
      1. histrio (C. V.) . . . 7
      2. erythrospilus Blkr. . . 8
      3. quinquestrigatus (C. V.) 10
      4. citrinus (Rüpp.) . . . 11
      5. heterospilos Blkr. . . 12
    3. *Pseudogobiodon* Bleeker . 13
      1. macrochir Blkr. . . . 13
  2. Subfam. Gobiinae 14
    1. *Schismatogobius* De Beaufort 19
      1. bruynisi Bfrt. 20
    2. *Mars* Jordan & Seale . . 21
      1. caeruleo-maculatus Herre 21
    3. *Intonsagobius* Herre . . 22
      1. kuderi Herre . . . 22
    4. *Smilogobius* Herre . . . 23
      1. inexplicatus Herre . . 25
      2. cinctus Herre 25
      3. singapurensis Herre . 26
    5. *Actinogobius* Bleeker . . 27
      1. ommaturus (Rich.) . . 27
    6. *Oplopomus* (Ehrenberg) Cuvier & Valenciennes . 28
      1. oplopomus (C. V.) . . 29
      2. caninoides (Blkr.) . . 31
    7. *Gladiogobius* Herre . . 32
      1. ensifer Herre 32
    8. *Stenogobius* Bleeker . . . 33
      1. gymnopomus (Blkr.) . 34
      2. genivittatus (C. V.) . 35

page

    9. *Parachaeturichthys* Bleeker 37
      1. polynema (Blkr.) . . 37
    10. *Oxyurichthys* Bleeker . . 39
      1. jaarmani M. Weber . 40
      2. longimanus (M. Weber) 41
      3. microlepis (Blkr.) . . 41
      4. tentacularis (C. V.) . 44
      5. papuensis (C. V.) . . 46
      6. auchenolepis Blkr. . . 49
    11. *Paroxyurichthys* Bleeker 50
      1. typus Blkr. 50
      2. laterisquamatus (M. Weber) 51
    12. *Acentrogobius* Bleeker . 52
      1. bontii (Blkr.) 54
      2. elberti Popta 55
      3. viridipunctatus (C. V.) 56
      4. chlorostigmatoides (Blkr.) 58
      5. janthinopterus (Blkr.) 59
      6. herrei Koumans . . . 61
      7. caninus (C. V.) . . . 61
      8. oligactis Blkr. 63
      9. cyanomos (Blkr.) . . 64
      10. puntang (Blkr.) . . . 66
      11. hendersoni (Herre) . . 68
      12. cauerensis (Blkr.) . . 68
      13. goldmanni (Blkr.) . . 70
      14. ornatus (Rüpp.) . . . 71
      15. balteata (Herre) . . . 73
      16. decoratus (Herre) . . 74
      17. globiceps (Hora) . . 75
      18. leptochilus Blkr. . . . 76
      19. reichei (Blkr.) . . . 77
    13. *Cryptocentrus* (Ehrenberg) Cuvier & Valenciennes . 79

page
1. diproctotaenia Blkr. . 81
2. cyanotaenia (Blkr.) . . 82
3. liolepis Blkr. 82
4. pavoninoides (Blkr.) . 83
5. niveatus (C. V.) . . 84
6. leptocephalus Blkr. . . 85
7. filifer (C. V.) . . . 86
8. papuanus (Peters) . . 87
9. russus (Cant.) . . . 88
10. fontanesii (Blkr.) . . 89
11. gymnocephalus (Blkr.) 91
14. *Oligolepis* Bleeker . . . 92
1. acutipennis (C. V.) . . 92
15. *Cristatogobius* Herre . . 94
1. lophius Herre 95
16. *Callogobius* Bleeker . . 96
1. liolepis (Blkr.) Koumans 97
2. hasseltii (Blkr.) . . . 98
3. centrolepis M. Weber 100
4. sclateri (Steind.) . . 100
5. snelliusi Koumans . . 102
17. *Redigobius* Herre . . . 103
1. dispar (Peters) . . . 104
2. chrysosoma (Blkr.) . . 105
18. *Waitea* Jordan & Seale . 106
1. mystacina (C. V.) . . 107
19. *Stigmatogobius* Bleeker . 108
1. sadanundio (H. B.) . 111
2. tambujon (Blkr.) . . 112
3. römeri (M. Weber) . 113
4. isognathus Blkr. . . . 115
5. oligactis (Blkr.) . . . 116
6. gastrospilos (Blkr.) . 117
7. mingi (Herre) . . . 118
8. poecilosoma (Blkr.) . 119
9. reticularis (M. Weber) 120
10. amblyrhynchus Blkr. . 121
11. oyensi (Bfrt.) . . . 122
12. javanicus (Blkr.) . . 122
13. penango (Popta) . . . 124
14. hoevenii (Blkr.) . . . 125
15. borneensis (Blkr.) . . 127
20. *Illana* Smith & Seale . . 128
1. bicirrhosus (M. Weber) 128
21. *Quisquilius* Jordan & Evermann 129
1. eugenius Jord. Everm. 130
2. malayanus Herre . . 132

page
3. macrophthalmus M. Weber 132
22. *Pandaka* Herre 133
1. pusilla Herre 134
2. pygmaea Herre . . . 135
23. *Amblygobius* Bleeker . . 135
1. inornatus Herre . . . 137
2. decussatus (Blkr.) . . 137
3. linki Herre 139
4. bynoensis (Rich.) . . 139
5. albimaculatus (Rüpp.) 141
6. sphynx (C.V.) 143
24. *Herreogobius* Koumans . 144
1. malekulae (Herre) . . 145
25. *Fusigobius* Whitley . . 146
1. neophytus (Gthr.) . . 146
?. labiatus (M. Weber) . 148
26. *Zonogobius* Bleeker . . 148
1. semidoliatus (C. V.) . 149
27. *Awaous* Cuvier & Valenciennes 150
1. grammepomus (Blkr.) . 151
2. stamineus (Val.) . . 153
28. *Tamanka* Herre 154
1. latifrons (Blgr.) . . 156
2. ubinensis Herre . . . 157
3. cavifrons (M. Weber) 157
4. sarasinorum (Blgr.) . 158
5. mertoni (M. Weber) . 159
6. siitensis Herre . . . 160
7. tagala Herre 160
29. *Glossogobius* Gill . . . 161
1. biocellatus (C. V.) . 163
2. giuris (H. B.) . . . 165
30. *Gnatholepis* Bleeker . . 168
1. baliurus (C. V.) . . 169
2. calliurus Jord. Seale . 170
3. anjerensis (Blkr.) . . 171
31. *Weberogobius* n.g. . . . 172
1. amadi (M. Weber) . 172
32. *Cottogobius* Koumans . . 174
1. bilobatus Koumans . . 175
33. *Ctenogobius* Gill . . . 176
1. gracilis Blkr. 178
2. criniger (C. V.) . . . 178
3. grammatogaster Blkr. . 180
4. notophthalmus Blkr. . 181
5. cylindricus Blkr. . . . 182
34. *Bathygobius* Bleeker . . 183
1. petrophilus (Blkr.) . . 184

page
2. scapulopunctatus (Bfrt.) 186
3. fuscus (Rüpp.) . . . 187
35. *Hemigobius* Bleeker . . 191
1. bleekeri n.n. 191
36. *Brachygobius* Bleeker . . 192
1. xanthozona (Blkr.) . . 193
2. nunus (H. B.) 194
3. aggregatus Herre . . 196
37. *Cryptocentroides* Popta . 197
1. insignis (Seale) . . . 197
3. Subfam. Periophthalminae 199
1. *Periophthalmus* Bloch ed. Schneider 200
1. weberi Eggert . . . 201
2. chrysospilos Blkr. . . 202
3. cantonensis novae-guineaensis Eggert . . . 203
4. malaccensis Eggert . . 205
5. variabilis Eggert . . 205
6. harmsi Eggert . . . 207
7. koelreuteri (Pall.) . . 207
8. gracilis Eggert . . . 210
9. vulgaris Eggert . . . 210
10. dipus Blkr. 212
11. argentilineatus C. V. . 214
2. *Periophthalmodon* Bleeker 215
1. schlosseri (Pall.) . . 216
2. tredecemradiatus (H. B.) 218
4. Subfam. Sicydiaphiinae . 219
1. *Sicyopterus* Gill 220
1. hageni Popta 222
2. microcephalus (Blkr.) . 223
3. gymnauchen (Blkr.) . 224
4. wichmanni (M. Weber) 226
5. cynocephalus (C. V.) . 226
6. parvei (Blkr.) . . . 228
7. macrostetholepis (Blkr.) 228
8. micrurus (Blkr.) . . 229
9. ouwensi M. Weber . . 231
10. longifilis Bfrt. . . . 232
11. brevis Bfrt. 233
12 xanthurus (Blkr.) . . 234
2. *Stiphodon* M. Weber . . 235
1. elegans (Steind.) . . 235
3. *Pleurosicya* M. Weber . 237
1. boldinghi M. Weber . 237
4. *Sicyopus* Gill 238

page
1. zosterophorum (Blkr.) 239
2. balinense (Blkr.) . . 240
3. multisquamatus Bfrt. . 241
5. *Gobiopterus* Bleeker . . 242
1. brachypterus (Blkr.) . 242
2. chuno (H. B.) . . . 244
3. variegatus (Peters) . . 244
6. *Leptogobius* Bleeker . . 245
1. oxypterus (Blkr.) . . 245
5. Subfam. Apocrypteinae . 246
1. Phalanx Apocryptei . . 246
1. *Pseudapocryptes* Bleeker 247
1. borneensis (Blkr.) . 247
2. lanceolatus (Bl. Schn.) 248
2. *Parapocryptes* Bleeker 250
1. macrolepis (Blkr.) . 251
2. henlei (Blkr.) . . . 251
3. *Apocryptichthys* Day . 252
1. cantoris (Day) . . 252
4. *Apocryptodon* Bleeker 253
1. madurensis (Blkr.) . 254
2. wirzi Koumans . . 256
2. Phalanx Boleophthalmi 257
1. *Boleophthalmus* Cuvier & Valenciennes . . . 257
1. sculptus Gthr. . . . 258
2. boddarti (Pall.) . . 259
3. pectinirostris (L.) . 261
2. *Scartelaos* Swainson . 262
1. viridis (H B.) . . 263
2. Fam. Taenioididae 265
1. Subfam. Taenioininae . . 265
1. *Brachyamblyopus* Bleeker 266
1. brachysoma (Blkr.) . 266
2. multiradiatus (Hardenberg) 267
3. coecus (M. Weber) . 268
4. urolepis (Blkr.) . . . 268
5. intermedius (Volz) . . 269
2. *Taenioides* Lacépède . . 269
1. cirratus (Blyth) . . 270
2. eruptionis (Blkr.) . . 272
3. buchanani (Day) . . 272
4. anguillaris (L.) . . . 273
3. *Odontamblyopus* Bleeker 274
1. rubicundus (H. B.) . 275
2. Subfam. Trypaucheninae . 276

page
1. *Trypauchen* Cuvier & Valenciennes 277
  1. vagina (Bl. Schn.) . . 277
  2. raha Popta 279
  3. taenia n.sp. 279
2. *Trypauchenichthys* Bleeker 280
  1. sumatrensis Hardenberg 280
  2. typus Blkr. 281
3. *Ctenotrypauchen* Steindachner 281
  1. microcephalus (Blkr.) 282
3. Fam. ELEOTRIDAE 283
1. *Bostrichthys* Duméril . . . 285
  1. sinensis (Lac.) 286
  2. strigogenys (Nichols) . . 287
  3. aruensis (M. Weber) . . 288
  4. zonatus (M. Weber) . . 288
2. *Asterropteryx* Rüppell . . 289
  1. semipunctatus Rüpp. . . 290
  2. ensiferus (Blkr.) . . . 291
3. *Eleotris* Bloch ed. Schneider 292
  1. eigenmanni Popta . . . 293
  2. fusca (Bl. Schn.) . . . 294
  3. melanosoma Blkr. . . . 297
  4. oxycephala Temm. Schl. . 299
  5. insulindica (Blkr.) . . . 300
  6. macrolepis (Blkr.) . . . 301
4. *Odontobutis* Bleeker . . . 302
  1. obscura (Temm. Schl.) . 302
5. *Butis* Bleeker 304
  1. prismaticus (Blkr.) . . . 305
  2. butis (H. B.) 306
  3. amboinensis (Blkr.) . . 308
  4. melanostigma (Blkr.) . . 309
  5. gymnopomus (Blkr.) . . 311
6. *Prionobutis* Bleeker . . . 312
  1. koilomatodon (Blkr.) . . 313
  2. dasyrhynchus (Gthr.) . . 314
  3. microps (M. Weber) . . 315
7. *Eviota* Jenkins 316
  1. zonura Jord. Seale . . . 317
  2. gymnocephalus M. Weber 318
  3. distigma Jord. Seale . . 319
  4. lachdeberei Giltay . . . 320
  5. nigriventris Giltay . . . 320
  6. prasites Jord. Seale . . 321
8. *Pogoneleotris* Bleeker . . . 323
  1. heterolepis (Gthr.) . . . 323

page
9. *Hypseleotris* Gill 324
  1. leuciscus (Blkr.) 325
  2. güntheri (Blkr.) 326
  3. taenionotopterus (Blkr.) . 327
  4. modestus (Blkr.) . . . 328
  5. cyprinoides (C. V.) . . . 328
  6. moncktoni (Regan) . . . 329
10. *Odonteleotris* Gill 329
  1. nesolepis M. Weber . . 330
  2. canina (Blkr.) 331
  3. macrodon (Blkr.) . . . 331
11. *Eleotriodes* Bleeker 332
  1. strigatus (Brouss.) . . . 334
  2. helsdingenii Blkr. . . . 335
  3. longipinnis (Benn.) . . . 336
  4. muralis (Q. G. C. V.) . . 337
  5. sexguttatus (C. V.) . . 339
12. *Amblyeleotris* Bleeker . . . 341
  1. periophthalmus (Blkr.) . 341
13. *Ophiocara* Gill 342
  1. porocephala (C. V.) . . 343
  2. aporos (Blkr.) 346
14. *Bunaka* Herre 349
  1. gyrinoides (Blkr.) . . . 350
  2. herwerdenii (M. Weber) . 351
15. *Oxyeleotris* Bleeker . . . 352
  1. marmorata (Blkr.) . . . 354
  2. urophthalmus (Blkr.) . . 355
  3. urophthalmoides (Blkr.) . 357
  4. lineolatus (Steind.) . . . 358
  5. fimbriatus (M. Weber) . 359
16. *Belobranchus* Bleeker . . . 361
  1. belobrancha (C. V.) . . 362
17. *Parioglossus* Regan . . . 363
  1. borneensis n.sp. 363
18. *Vireosa* Jordan & Snyder . 364
  1. hanae Jord. Snyd. . . . 365
19. *Ptereleotris* Gill 367
  1. microlepis (Blkr.) . . . 367
  2. heteropterus (Blkr.) . . 368
20. *Nemateleotris* Fowler . . 369
  1. magnificus Fowler . . . 369
21. *Orthostomus* Kner 370
  1. amblyopinus Kner . . . 370
22. *Oxymetopon* Bleeker . . . 372
  1. typus Blkr. 372
23. *Mogurnda* Gill 373
  1. mogurnda mogurnda (Rich.) 374
4. Fam. RHYACICHTHYIDAE . . . 376

page
1. *Rhyacichthys* Boulenger . . 376
1. aspro (C. V.) 376
Species incertae 378
Gobius kuhlii Blkr. 378
Gobius modestus Blkr. 379
Gobius baliuroides Blkr. . . . 379
Gobius zelei Sauv. 380
Gobius sella (Heck. M. S.) Steind. 380
Lophogobius wera Popta . . . 381
Gobius beccarii Perugia . . . 381
Gobius modiglianii Perugia . . 382
Gobius rhombomaculatus Karoli 383
Gobius melanopus Blkr. . . . 383
Gobiosoma pallida Herre . . 383
Lophogobius bleekeri Popta . . 384
Chaenogobius megacephalus Fowler 384

page
Kelloggella spec. 385
Ctenogobius bleekeri Herre . . 385
Gobius polycynodon Blkr. . . . 385
Vaimosa avicennia Herre . . 386
Vaimosa jurongensis Herre . 386
Vaimosa kabilia Herre 388
Vaimosa oratai Herre 389
Macgregorella bravoi Herre . . 390
Rhinogobius suluensis Herre . 391
Gobioides tenuis (C. V.) . . . 391
Trypauchen vagina (?) Volz . 391
Eleotris compressa Krefft . . 391
Eleotris squamifrons Perugia . 391
Eleotris hilgendorfi Pietschmann 392
Probable hybrids of Gobioidea 392

Order GOBIOIDEA

Airbladder mostly wanting. Shape of body from oblong to very elongate. Head generally with mucous canals and open pores. Scales ctenoid, cycloid, reduced or even wanting. Lateral line absent. Mouth more or less terminal, bordered by the protractile praemaxillaries. Skull more or less contracted between and expanded behind the orbits. Parietals absent, epiotics separated by supraoccipital; exoccipital condyles wide apart, opisthotics large, reaching basioccipital and separating the exoccipitals from pro-otics. No basisphenoid and no myodome. Nasals and praeorbitals are thin lamina loosely attached to the lateral ethmoids; suborbitals unossified. Hyomandibular very broad; a large foramen between symplectic, quadrate and praeoperculum; mesopterygoid slender or absent. Palatine with well developed maxillary process supported by an apophysis of the lateral ethmoid. Lower pharyngeals separate. Posttemporal forked, postcleithrum single. Pectoral radials 4, large, laminar, united to form a plate. Vertebrae 25-34. First centrum with a pair of lateral apophyses which articulate with the exoccipital condyles. Ribs on well developed transverse parapophyses; epipleurals on ribs. Pseudobranchiae present, sometimes rudimentary. Four gills. Gillmembranes attached to the isthmus. Spinous dorsal, when present, with a few flexible spines. Anal fin similar to soft dorsal fin, without a spine or with a feeble spine. Ventral fins thoracic or subjugular, each with a weak spine and 4 or 5 soft rays. They are close together and in some families united to a single fin. In Rhyacichthyidae the ventral fins are widely separated. Anal papilla present.

Key to the Indo-Australian families of Gobioidea

A. Ventral fins united.
  a. Two dorsal fins, separate or connected by their bases . . . . 1. *Gobiidae* p. 2.
  b. One dorsal fin, which is very elongate. Body eel-like . . . . 2. *Taenioididae* p. 265.
B. Ventral fins separate.
  a. Ventral fins close together . . . . 3. *Eleotridae* p. 283.
  b. Ventral fins widely separated . . . . . . 4. *Rhyacichthyidae* p. 376.

1. Family GOBIIDAE

Gobioidea with united ventral fins, which are sometimes totally or posteriorly incised, basal membrane present or absent. Two dorsal fins, separate or connected with their bases, the first dorsal fin may be absent. Body scaled with ctenoid or cycloid scales, sometimes partly or totally absent.

Distribution: All over the world, but especially in the temporate and tropical regions in freshwater, estuaries and sea.

Key to the Indo-Australian subfamilies of Gobiidae

A. Body oval, strongly compressed. Teeth in several rows. Dorsal fins more or less contiguous	1. *Gobiodontinae* p. 2.
B. Body more or less elongate.	
1. Teeth of lower jaw in some rows . . .	2. *Gobiinae* p. 14.
2. Teeth of lower jaw in one row.	
a. Second dorsal fin not elongated.	
a'. Eye prominent above the dorsal profile. Free lower eyelid developed. Base of pectoral fin muscular . . .	3. *Periophthalminae* p. 199.
b'. Eye not prominent. Free lower eyelid wanting. Base of pectoral fin not muscular	4. *Sicydiaphiinae* p. 219.
b. Second dorsal fin elongated. Teeth of lower jaw subhorizontal. Scales cycloid.	5. *Apocrypteinae* p. 246.

1. Subfamily GOBIODONTINAE

Body compressed, oval. Head blunt, naked. Mouth narrow, curved. Teeth in several rows, simple. Gillopenings about as long as breadth of base of pectoral fin. Soft dorsal fin and anal fin short. Ventral fins united and only attached to the belly by their bases. Caudal fin rounded.

Distribution: East coast of Africa and Red Sea to the Pacific.

Key to the Indo-Australian species of Gobiodontinae

A. Body with large scales	1. *Paragobiodon* p. 3.
B. Body without scales, covered by a thick naked skin.	
a. In lower jaw on both sides of symphysis at	

the inner side of the band of teeth one or some canines . . . . 2. *Gobiodon* p. 5.

b. No canines on both sides of symphysis of lower jaw . . . . 3. *Pseudogobiodon* p. 13.

1. **Paragobiodon** Bleeker.

(Bleeker, Ned. Tijdschr. Dierk. 4, 1873, p. 129 and Arch. neerl. sc. ex. et nat. 9, 1874, p. 309).

Rüppelia and *Rupellia* Swainson, Nat. Hist. Class. Amph. Rept. Fishes 2, 1839, pp. 184, 281 (preocc.).

Body compressed, covered with 22-24 strong ctenoid scales. Head nearly globular, less than 2 times so high as wide, naked, covered with papillary appendices. Some open pores above on head, behind eye and along the margin of praeoperculum. Nostrils in short tubes. No barbels. Mouth very oblique, jaws subequal. A band of filiform teeth in each jaw, outer row enlarged. In lower jaw on both sides of symphysis at the inner margin of the band of teeth one or two canines. Tongue rounded. Isthmus broad. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 I. 9-10. Anal fin similar to soft dorsal fin. Pectoral fin without free rays. Caudal fin rounded.

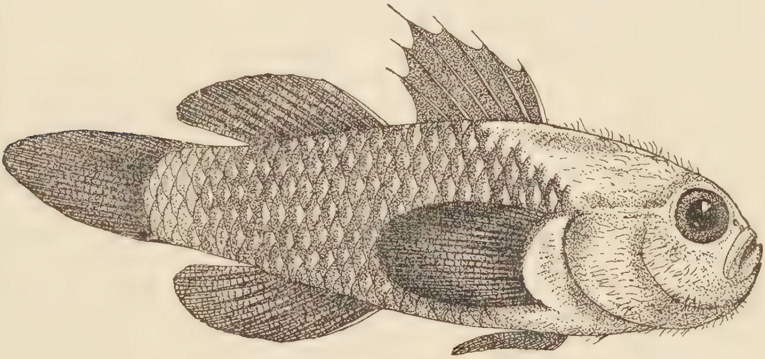

Fig. 1. *Paragobiodon echinocephalus* (Rüpp.) × 4.

Distribution: Red Sea to the Pacific.

1. **Paragobiodon echinocephalus** (Rüpp.) (Fig. 1, p. 3)

Gobius echinocephalus Rüppell, Atl. Reise N. Afr. Fische 1828, p. 136, pl. 34 fig. 3.

Gobius amiciensis Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 135.

Gobius xanthosoma Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 703.
Gobius melanosoma Bleeker, ibidem.
Gobius echinocephalus Günther, Cat. Fishes 3, 1861, p. 34.
Gobius amiciensis Günther, o.c. p. 35.
Gobius xanthosoma Günther, o.c. p. 42.
Gobius gobiodon Day, Proc. Zool. Soc. London 1869, p. 516.
Gobius echinocephalus Klunzinger, Verh. zool. bot. Ges. Wien 21, 1871, p. 475.
Gobius echinocephalus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 175, pl. 108 fig. D.
Gobius melanosoma Day, Fishes India 1878, p. 297, pl. 64 fig. 1.
Gobius amiciensis Sauvage, Bull. Soc. Philom. Paris (7) 4, 1880, p. 41.
Gobius gibbosus Macleay, Proc. Linn. Soc. N.S. Wales 5, 1881, p. 601.
Gobius scabriceps Macleay, o.c. p. 603.
Gobius melanosoma Day, Fauna Brit. India Fishes 2, 1889, p. 269.
Gobius amiciensis Sauvage, Poissons de Madagascar 1891, p. 352, pl. 41 fig. 3.
Gobius waitei Garman, Bull. Mus. Comp. Zool. Harvard 39, 1903, p. 234, pl. 3 fig. 3.
Paragobiodon echinocephalus Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 397.
Paragobiodon xanthosomus Jordan & Seale, ibidem.
Paragobiodon melanosomus Jordan & Seale, o.c. 26, (1906) 1907, p. 45.
Ruppellia lacunicola Kendall & Goldsborough, Mem. Mus. Comp. Zool. Harvard 26 no. 7, 1911, p. 318, pl. 6 fig. 1.
Gobius echinocephalus M. Weber, Siboga Exp. Fische 1913, p. 457.
Paragobiodon echinocephalus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 239, pl. 34 fig. 1.
Paragobiodon echinocephalus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 172, pl. 13 fig. 2.
Paragobiodon melanosomus Herre, o.c. p. 174.
Paragobiodon xanthosomus Herre, o.c. p. 175.
Paragobiodon echinocephalus Fowler, Mem. B. P. Bishop Mus. 10, 1928, p. 399.
Paragobiodon kerri H. M. Smith, Proc. U.S. Nat. Mus. 79, (1931) 1932, p. 42, fig. 20.
Paragobiodon echinocephalus Giltay, Mem. Mus. Roy. Hist. Nat. Belgique Hors Serie 5, 1933, p. 96.
Paragobiodon melanosoma Giltay, o.c. p. 97.
Paragobiodon echinocephalus Herre, Field Mus. N.H. Zool. 21, 1936, p. 363.
Paragobiodon echinocephalus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 57.
Ruppellia lacunicola Koumans, Zool. Meded. Leiden 22, 1940, p. 129 (as synonym).
Paragobiodon kerri Koumans, o.c. p. 130 (as synonym).
Paragobiodon echinocephalus Koumans, Mem. Indian Mus. 13, 1941, p. 208.

D. 1 VI; D. 2 I. 9-10; A. I. 8-9; P. 18-22; L.l. 22-27; L.tr. 9-10 (11).

Body oblong, compressed, height 3 in length, $3^1/_3$-4 in total length. Head very obtuse, convex, 3 to more than 3 in length, 4 in total length, covered with small papillae, head as long as high. Eye 3-4 in head, interorbital more than 1 eyediameter. Snout very obtuse, from shorter than eye to as long as eye. Mouth oblique, curved, jaws subequal. Maxillary extends to below anterior border of eye or to middle of eye. Teeth in many rows, outer row enlarged. In lower jaw on each side of symphysis an erected canine. Open pores on front, round the orbits, on opercle and 2-3 rows on preopercle. Gillopenings extend to before the undermost rays of pectoral fin. Head naked, nape and breast naked; back naked to second or sixth ray of first dorsal fin. Scales of body ctenoid. Bases of dorsal fins continuous. First dorsal fin lower than second dorsal fin, obtuse, middle rays are the longest. Second dorsal fin obtuse, convex. Pectoral fin obtusely rounded, a little shorter than head or as long as head. Ventral fins not shorter than postorbital part of head, basal membrane emarginate. Anal fin similar to second dorsal fin. Caudal fin obtuse, shorter than head. Colour of head red-orange to yellowish; body of the same colour or darkish to black. Iris orange-greenish to violet. Fins a little darker than body. Length 40 mm.

Habitat: Simalur (Sinabang bay!); Tanah Djampea!; Flores (Pulu Serbete!); Solor (Lawajong, Lamakera!); Timor (Kupang!, Atapupu); Kera!; Borneo (Lumu lumu!, Kabala dua!); Sulu Islands (Sitankai, Barbas!, Jolo); Celebes (Kema, Bone Tambung near Makassar!; Maratua!, Muaras reef!); Talaud Islands (Beo!); Saleyer!; Halmahera (Kau bay Ake Selaka!); Ternate; Batjan; Obi latu!; Buru (Kajeli); Ceram (Wahai); Ambon! (Batu merah!); Goram; Banda!; Between Banda Neira and Gunung Api; Kei Islands (Tual!); Tenimber Islands (Wotap!); New Guinea (Doreh). — Red Sea! and Southeast coast of Africa (Inhaca!) and Madagascar!, Ceylon!, Andamans!, Nicobars!, Siam!, China, Japan, Philippines!, Samoa, Australia (Cairns!, Port Darwin!) to the Pacific Islands. — In sea.

Types of *Gobius amiciensis* seen in Paris Museum, type *Ruppellia lacunicola* seen in U.S. Nat. Mus., type *Paragobiodon kerri* seen in U.S. Nat. Mus.

2. **Gobiodon** Bleeker

(Bleeker, Nat. Tijdschr. Ned Indië 11, 1856, p. 407).

Ellerya Castelnau, Proc. Zool. Soc. Victoria 2, 1873, p. 95.

Body strongly compressed, oval, covered by a thick, granulous, slimy skin. Head compressed, much higher than wide (about 2 times). Tubiform pores around the margin of preoperculum; the lower margin of preoperculum and mandible with small papillae. Mouth a little oblique, jaws subequal. Teeth in both jaws in several rows, the outer a little enlarged. In lower jaw on both sides of symphysis at the inner side of the band of teeth one or some canines. Tongue truncate to rounded. Isthmus broad. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 I. 8-12. Anal fin similar to second dorsal fin. Ventral fins short. Caudal fin and pectoral fin rounded.

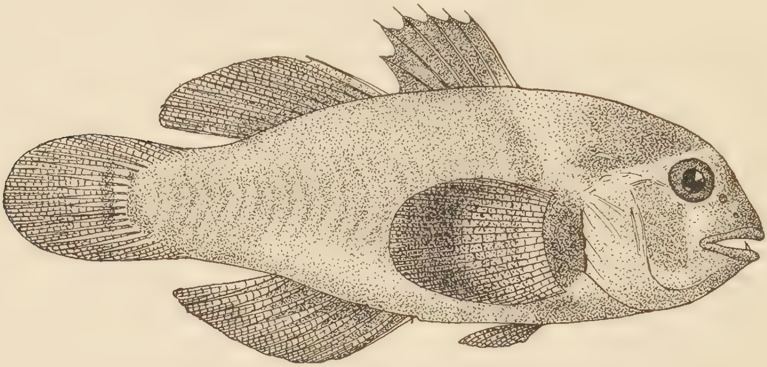

Fig. 2. *Gobiodon quinquestrigatus* (C.V.). × 2½.

Distribution: Red Sea to the Pacific.

Key to the Indo-Australian species of Gobiodon

A. D. 2 I. 10-11. Fins without spots. Ventral fins much shorter than head.

1. In lower jaw on each side 1-2 canines. First dorsal fin lower than the second, foremost ray is the shortest.

a. Body with longitudinal blue bands and spots. Gillopening extends below to before lower rays of pectoral fin. . . . 1. *G. histrio* p. 7.

b. No stripes longitudinally on body.

a'. Gillopening extends below to before lower rays of pectoral fin. Body yellow with carmine spots placed in longitudinal rows. Anterior part of body with 5-6 transversal carmine lines, 3 or 4 on head, 5th on base of pectoral fin. Head deeper than long.

Upper part of operculum often with a brown spot . . . . 2. *G. erythrospilus* p. 8.

b'. Gillopening does not extend to before lower rays of pectoral fin. Body brownish with in front mostly 5 obliquely placed blue stripes, 4 on head, 5th on base of pectoral fin. Head longer than deep. Upper part of operculum without brown spot . . . 3. *G. quinquestrigatus* p. 10.

2. In lower jaw on each side 3-4 canines. Height of dorsal fins equal. Foremost ray of first dorsal fin is the longest. Body without bands or spots, brown. Gillopening does not extend to before lower rays of pectoral fin. Anterior part of body with 4 blue transverse stripes, 3 on head, 4th on base of pectoral fin. Operculum above with a blackish spot . . . . 4. *G. citrinus* p. 11.

B. D. 2 I. 8, as high as first dorsal fin. Foremost ray of first dorsal fin is the longest. Gillopening extends to before lower rays of pectoral fin. Body and fins reddish or yellowish without bands. Head and caudal fin with black spots . . . . 5. *G. heterospilos* p. 12.

1. **Gobiodon histrio** (C.V.)

Gobius histrio Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 132, pl. 347.
Gobius histrio Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, pl. fig. 6.
Gobiodon histrio Bleeker, o.c. 11, 1856, p. 408.
Gobiodon histrio Günther, Cat. Fishes 3, 1861, p. 88.
?*Ellerya unicolor* Castelnau, Proc. Zool. Soc. Victoria 2, 1873, p. 95.
?*Gobiodon histrio* Peters, Monatsber. Ak. Berlin 1876, p. 840.
?*Gobiodon verticalis* Alleyne & Macleay, Proc. Linn. Soc. N.S. Wales 1, 1877, p. 333.
?*Gobius douglasi* Kent, Great Barrier Reef 1893, p. 310, pl. 16 fig. 12.
?*Pseudogobiodon verticalis* Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 410.
Gobiodon verticalis McCulloch & Ogilby, Rec. Austr. Mus. 12, 1919, p. 208, pl. 32 fig. 2.
Gobiodon verticalis Koumans, Zool. Meded. Leiden 22, 1940, p. 157 (as probable synonym).

D. 1 VI; D. 2 I. 10; A. I. 9; P. 19-21.

Height of body 2.61 in length. Head 3-3.6 in length, 4 in total length. Head a little higher than long. Eye 4 in head. Maxillary extends to very slightly beyond front margin of eye. Two canines in lower jaw behind symphysis. Front margin of eye with a real tentacle, otherwise small open pores in front and along posterior margin of preoperculum. Gillopening extends to before lower rays of pectoral fin. First dorsal fin lower than second dorsal fin. Foremost ray of first dorsal fin is the shortest. Colour orange, darker at the back. On head vertical blue bands, on body longitudinal blue bands. Two blue lines on base of pectoral fin. Other fins orange to yellow. Length 70 mm.

Habitat: Java (Bantam); ?Timor; Kera near Timor!. — Nicobars, Samoa, Paumotu Islands, Tongatabu!, ?Darnley Island!, ?Fitzroy Island!, ?Queensland. — In sea.

Two specimens from Tongatabu, Quoy & Gaimard types? of *Gobius histrio,* seen in the Paris Museum, types of *Gobiodon verticalis* seen in Macleay Museum, Sydney.

Note: In preserved state the colours fade soonly and nearly completely. It is then nearly impossible to distinguish *Gobiodon erythrospilus* Blkr. from this species. So the distribution may be a larger one than stated here.

2. **Gobiodon erythrospilus** Blkr.

Gobius quinquestrigatus Bleeker, Verh. Bat. Gen. 22, 1849, p. 29 (not of C.V.).
Gobius quinquestrigatus Bleeker, Nat. Tijdschr. Ned. Indië 5, 1853, p. 82 (not of C.V.).
Gobiodon quinquestrigatus Bleeker, o.c. 11, 1856, p. 408 (not of C.V.).
Gobiodon quinquestrigatus Günther, Cat. Fishes 3, 1861, p. 87 (not of C.V.).
Gobiodon erythrospilus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 122.
Gobiodon erythrospilus Day, Fishes India 1878, p. 298.
Gobiodon erythrospilus Day, Fauna Brit. India Fishes 2, 1889, p. 271.
Gobiodon atrangulatus Garman, Bull. Mus. Comp. Zool. Harvard 39 no. 8, 1903, p. 234, pl. 2 fig. 2.
Gobiodon erythrospilus M. Weber, Siboga Exp. Fische 1913, p. 455.
Gobiodon quinquestrigatus De Beaufort, Bijdragen Dierkunde 1913, p. 142 (pro parte).
Gobiodon citrinus Fowler & Bean, Proc. U.S. Nat. Mus. 71, art. 10, 1928, p. 11 (not of Rüppell).
Gobiodon fulvus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 292.
Gobiodon atrangulatus Koumans, Zool. Meded. Leiden 22, 1940 p. 136 (as synonym).
Gobiodon fulvus Koumans, o.c. p. 192 (as synonym).
Gobiodon erythrospilus Koumans, Mem. Indian Mus. 13, 1941, p. 210.

D. 1 VI; D. 2 I. 10-11; A. I. 9; P. 19-21.

Body compressed, oblong, height $2^1/_2$ in length, 3-$3^1/_3$ in total length. Head obtuse, convex, $3^1/_2$ in length, $4^1/_4$-$4^1/_2$ in total length, deeper than long. Eye 4-$4^1/_2$ in head, interorbital $^3/_4$-1 eyediameter.

Snout obtuse, shorter than eye. Mouth curved, jaws subequal. Maxillary extends to below anterior half of eye. Teeth in a few rows, outer row a little enlarged. In lower jaw on each side of symphysis a canine tooth. Gillopening extends to before the undermost ray of pectoral fin. Open pores round the orbit and on preopercle and opercle. Bases of dorsal fins continuous. First dorsal fin much lower than second dorsal fin, obtuse convex, the posterior rays are the longest. Second dorsal fin half as high as body, obtuse convex. Pectoral fin obtuse, rounded, as long as or a little shorter than head. Ventral fin a little shorter than postorbital part of head, basal membrane well developed. Anal fin similar to second dorsal fin. Caudal fin obtusely rounded, shorter than head. Colour yellow to orange. Iris greenish with golden margin of pupil. Head and anterior part of body with purple transverse lines, which may be present to below first dorsal fin. First line from eye to behind maxillary, second on preopercle, third on opercle, fourth behind gillopening or on gillmembranes, fifth on base of pectoral fin. On body seven longitudinal rows of purple spots. Vertical fins with violet margin. A dark spot on upper part of operculum is often present. Length 48 mm.

Habitat: Singapore; Pulu Weh!; Batu Islands; Sumatra (Telok Betong!, Pulu Tikus near Benkulen!); Cocos Islands (Nova Selma); Java (Island Leiden!); Sumbawa (Bima); Solor (Lawajong); Timor; Kera near Timor!; Borneo (Kabala dua, Muaras reef); Celebes (Kema, Paleleh!); Talaud Islands (Beo); Saleyer; Halmahera (Ake Selaka Kau bay!); Salomakië; Morotai!; Buru (Kajeli); Ambon!; Goram; Banda!; Kei Islands (Tual); Sissi near Misol!; New Guinea (Doreh, Sorang door). — India!, Ceylon!, Andamans!, Nicobars!, Philippines (Mindoro!), Torres Strait Queensland, Fiji (Nairai!), Paumotu Islands. — In sea.

Types of *Gobiodon erythrospilus* seen in the Leiden Museum, type of *Gobiodon atrangulatus* seen in Mus. Comp. Zoöl. Cambridge (Mass.), type of *Gobiodon fulvus* seen in Bur. Sci. Manila.

Note: As in preserved state the colours fade, it is extremely difficult to distinguish *Gobiodon histrio* from *erythrospilus*. The synonyms *Ellerya unicolor* Castelnau, *Gobiodon verticalis* Alleyne & Macleay, *Gobius douglasi* Kent and *Pseudogobiodon verticalis* Jordan & Seale, stated as probable synonyms of *Gobiodon histrio,* may therefore belong to *G. erythrospilus.*

3. **Gobiodon quinquestrigatus** (C. V.) (Fig. 2, p. 6)

?*Gobius rivulatus* Rüppell, Atl. Reise N. Afr. Fische 1828, p. 136.
Gobius quinquestrigatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 134.
Gobius erythrophaios Bleeker, Verh. Bat. Gen. 22, 1849, p. 29.
Gobius ceramensis Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 704.
Gobiodon erythrophaios Bleeker, o.c. 11, 1856, p. 409 (pro parte).
Gobiodon ceramensis Günther, Cat. Fishes 3, 1861, p. 88.
Gobiodon ceramensis Bleeker, Ned. Tijdschr. Dierk. 2, 1865, p. 292.
Gobiodon quinquestrigatus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 117 (not of Blkr., Nat. Tijdschr. Ned. Indië 11, 1856, p. 408).
Gobiodon rivulatus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 180, pl. 109 figs. F, G.
Gobiodon ceramensis Günther, o.c. p. 182, pl. 109 fig. D.
Gobiodon quinquestrigatus Day, Fishes India 1878, p. 297.
Gobiodon rivulatus Day, o.c. Suppl. 1888, p. 794.
Gobiodon rivulatus Day, Fauna Brit. India Fishes 2, 1889, p. 270.
Gobiodon quinquestrigatus M. Weber, Siboga Exp. Fische 1913, p. 454 (pro parte).
Gobiodon quinquestrigatus De Beaufort, Bijdragen Dierkunde 1913, p. 142 (pro parte).
Gobiodon quinquestrigatus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, pp. 210, 211, fig. 4.
Gobiodon quinquestrigatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 294.
Gobiodon quinquestrigatus Giltay, Mem. Mus. Roy. Hist. Nat. Belgique Hors Serie 5, 1933, p. 98, fig. 29.
Gobiodon ceramensis Giltay, o.c. p. 98.
Gobiodon quinquestrigatus Koumans, Mem. Indian Mus. 13, 1941, p. 211.

D. 1 VI; D. 2 I. 10; A. I. 8-9; P. 17-19.

Body oblong, compressed, height 3-3$^1/_2$ in length. Head obtuse convex, 3$^1/_2$ in length, 4-4$^2/_3$ in total length. Head as high as long or longer than deep. Eye 3-4 in head, interorbital $^1/_2$-1 eyediameter. Snout obtuse, shorter than eye. Mouth curved, jaws subequal. Maxillary extends to below middle of eye or not so far. Teeth in a few rows, inner rows minute, outer row in upper jaw enlarged, conical. In lower jaw the foremost teeth are enlarged, on each side of symphysis 1-2 canines. Gillopening does not extend to before the undermost rays of pectoral fin. Open pores on head round the orbits and on preoperculum and operculum, sometimes not distinct. Bases of dorsal fins continuous. First dorsal fin lower than the second, obtuse, the posterior rays are the longest. Second dorsal fin half as high as body, obtuse. Pectoral fin obtuse, scarcely longer than head. Ventral fin shorter than postorbital part of head, basal membrane well developed. Anal fin obtuse, shorter than second dorsal fin. Caudal fin obtusely convex, shorter than head. Colour blackish to blackish orange. Iris greenish with golden margin of pupil. No black spot on upper part of opercle. Fins blackish to reddish. On head and foremost part of body bluish transverse lines, the first through eye to maxillary, second through eye to behind maxillary, third on cheeks, fourth on opercle, fifth on base of pectoral fin. The transverse lines may be present to below first dorsal fin. Length 46 mm.

Habitat: Simalur (Sinabang!); Sumbawa (Bima); Kera near Timor!; ?east point of Timor; Borneo (?Kabala dua!, Muaras reef!); Celebes (Bulucomba); Talaud Islands (Beo!); Ternate; Obi latu!; Buru (Kajeli); Ceram (Wahai); Ambon!; Goram; between Banda Neira and Gunung Api; New Guinea (Doreh, Sorong door). — Red Sea, Madagascar, India!, Andamans!, Nicobars, China, Philippines (Mindoro!), Fiji Islands, Samoa!, Tongatabu!, New Hebrides, Tahiti, Queensland (Cairns!). — In sea.

Type of *Gobius quinquestrigatus* seen in Paris Museum.

4. **Gobiodon citrinus** (Rüpp.)

Gobius citrinus Rüppell, Neue Wirbelthiere Fische 1838, p. 139, pl. 32 fig. 4.
Gobiodon erythrophaios Bleeker, Nat. Tijdschr. Ned. Indië 6, 1856, p. 409 (pro parte).
Gobiodon citrinus Klunzinger, Verh. zool. bot. Ges. Wien 21, 1871, p. 480.
Gobiodon hypselopterus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 120.
Gobiodon citrinus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 181, pl. 109 fig. E.
Gobiodon citrinus Day, Fishes India 1878, p. 298, pl. 64 fig. 2.
Gobiodon citrinus Day, Fauna Brit. India Fishes 2, 1889, p. 271, fig. 91.
Pseudogobiodon citrinus Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 410.
Gobiodon quinquestrigatus M. Weber, Siboga Exp. Fische 1913, p. 454 (pro parte).
Gobiodon hypselopterus De Beaufort, Bijdragen Dierkunde 1913, p. 142.
Gobiodon citrinus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 212.
Gobiodon hypselopterus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 293, pl. 28 fig. 2.
Gobiodon citrinus Fowler, Mem. B. P. Bishop Mus. 10, 1928, p. 398.
Gobiodon citrinus Koumans, Mem. Indian Mus. 13, 1941, p. 209.

D. 1 VI; D. 2 I. 10; A. I. 9; P. 19-21.

Body oblong, compressed, height $2^1/_3$ in length, 3-$3^1/_4$ in total length. Head obtuse convex, 3-$3^3/_4$ in length, 4-$4^1/_2$ in total length. Head as high as long. Eye 3-$3^1/_3$ in head, interorbital less than 1 eyediameter. Snout obtuse, shorter than eye. Mouth curved, jaws equal. Maxillary extends to below anterior half of eye. Teeth in a few rows, inner row minute, outer row enlarged, conical. In lower jaw on each side of symphysis 3-4 canines. Gillopening does not extend to before undermost rays of pectoral fin. Open pores on front, snout, round the orbits and on preopercle. Bases of dorsal fins continuous. First dorsal fin not lower than second dorsal fin, about as high as body, pointed. The foremost rays are the longest. Second dorsal fin obtuse. Pectoral fin obtuse, a little longer than head. Ventral fin not shorter than postorbital part of head. Anal fin similar to second dorsal fin. Caudal fin obtusely rounded, about as long as head. Colour of body and fins blackish to orange. Iris violet to greenish. Upper part of operculum with a black spot. Four blue transversal lines on anterior part of body: two through eye to maxillary, the third on opercle, the fourth on base of pectoral fin. Base of second dorsal fin and anal fin with longitudinal blue band, bordered with violet or black. Length 51 mm.

Habitat: Simalur (Sinabang bay!); Kera near Timor!; Celebes (Kwandang bay!); Saleyer!; Ternate; Buru (Kajeli); Ceram (Wahai); Ambon!; Kei Islands (Tual!). — Red Sea, Madagascar, India!, Andamans, Nicobars!, Philippines, New Hebrides, Solomon Islands, Caroline Islands, Tonga Islands, Pelew Islands, Samoa, Australia. — In sea.

Types of *Gobiodon hypselopterus* seen in the Leiden Museum.

5. **Gobiodon heterospilos** Blkr.

Gobiodon heterospilos Bleeker, Nat. Tijdschr. Ned. Indië 11, 1856, p. 409.
Gobiodon heterospilos Günther, Cat. Fishes 3, 1861, p. 88.
Gobiodon heterospilos M. Weber, Siboga Exp. Fische 1913, p. 455.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 16-17.

Body oblong, compressed, height $3^3/_4$ in total length. Head obtuse convex, $4^1/_2$ in total length. Head as high as long. Eye 3 in head, interorbital less than 1 eyediameter. Snout obtuse, much shorter than eye. Mouth a little curved, jaws subequal. Maxillary extends to below anterior part of eye. Teeth in a few rows, inner rows minute, outer row in upper jaw much, in lower jaw a little enlarged. In lower jaw on each side of symphysis a curved canine. Open pores on front, round the orbit, on preopercle. Gillopening extends to before undermost rays of pectoral fin. Bases of dorsal fins continuous. Dorsal fins equal of height, half of height of body. First dorsal fin pointed, anteriorly higher than posteriorly. Second dorsal fin obtuse. Pectoral fin obtuse, a little longer than head. Ventral fin not shorter than postorbital part of head, basal membrane well developed. Anal fin similar to second dorsal fin. Caudal fin obtusely rounded, shorter than head. Colour yellowish red. Iris yellowish greenish. Head and caudal fin with many blackish spots. Dorsal and anal fins with dusky spots. Length 25 mm.

Habitat: ?Morotai!; Buru (Kajeli!); Kei Islands (Tual!). — In sea.

Type of *Gobiodon heterospilos* seen in the Leiden Museum.

3. **Pseudogobiodon** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 309 and o.c. 10, 1875, p. 117).

This genus agrees in nearly all respects with *Gobiodon,* only it wants the canines on both sides of symphysis of lower jaw. All teeth in lower jaw are a little smaller.

Distribution: that of the single species known.

1. **Pseudogobiodon macrochir** Blkr.

Pseudogobiodon macrochir Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 116.

D. 1 VI; D. 2 I. 9; A. I. 9; P. 16

Body oblong, very compressed, height 3 in total length. Head obtuse, convex, a little more than 4 in total length, as high as long. Eye 3 in head, interorbital $^1/_2$ eyediameter. Snout very obtuse, shorter than eye. Mouth curved, jaws subequal. Maxillary extends to below anterior border of eye. Teeth in a few rows, pointed, small. In upper jaw in front teeth are a little enlarged, in lower jaw outer row not enlarged. Open pores numerous in interorbital space and on cheek and opercle. Gillopening does not extend to before undermost rays of pectoral fin. Skin of back and in supra-anal region rough with oblique stripes. Bases of dorsal fins continuous. First dorsal fin not or a little lower than second dorsal fin, anteriorly higher than posteriorly. Second dorsal fin and anal fin pointed. Pectoral fin obtuse, rounded, longer than head. Ventral fin does not reach anus, not longer than head without snout, basal membrane well developed. Caudal fin obtuse, rounded, not or a little longer than head.

Colour reddish orange. Fins red. Iris violet green, margin of pupil golden. Length 38 mm.

Habitat: Ambon!. — In sea.

Type seen in the Leiden Museum.

2. Subfamily GOBIINAE

Body oblong to elongate. Head naked between and before the eyes. Teeth simple, top of teeth not incised. Teeth in upper jaw in one to several rows, in lower jaw in two to several rows. The second dorsal fin is longer than the first, which is wanting in a few genera. Ventral fins totally or nearly totally united, only attached in their bases to the belly, basal membrane sometimes wanting. Gillopenings moderate to wide.

Distribution: all over the world.

Key to the Indo-Australian of Gobiinae

I. Body naked. D. 2 I. 8-9	1. *Schismatogobius* p. 19
II. Body scaled, at least in its posterior half.	
A. Vomer with teeth.	
1. Scales of body ctenoid posteriorly, cycloid anteriorly, 54-65 in L.l. Teeth on vomer blunt	2. *Mars* p. 21.
2. Scales of body ctenoid posteriorly, cycloid anteriorly, 24-30 in L.l. .	3. *Intonsagobius* p. 22.
3. Scales of body cycloid., ± 70-± 85 in L.l. Teeth on vomer two large incisors	4. *Smilogobius* p. 23.
B. Vomer without teeth.	
1. First dorsal fin with 8-9 rays. D. 2 I. 17-20; A. I. 14-17. L.l. 70 ctenoid scales. Gillopenings not wide.	5. *Actinogobius* p. 27.
2. First dorsal fin with 6 or less than 6 rays.	
a. First ray of both dorsal fins strong and bony. Preopercle armed behind with some teeth.	6. *Oplopomus* p. 28.
b. First ray of both dorsal fins not strong and bony. Preopercle with a single long spur-like spine	7. *Gladiogobius* p. 32.
c. First ray of both dorsal fins not strong and body. Preopercle not armed.	

- *a'*. Caudal fin long, pointed or lanceolate, longer than head.
  - *aa*. Some fleshy flaps on inner edge of shouder-girdle . . . . 8. *Stenogobius* p. 33.
  - *bb*. No fleshy flaps on inner edge of shoulder girdle.
    - *α*. Barbels along rami of lower jaw. Gillopenings not continued forward below, isthmus broad. About 30 ctenoid scales in L.l. 9. *Parachaeturichthys* p. 37.
    - *β*. No barbels along rami of lower jaw.
      - *α'*. Teeth in upper jaw in one row. . . 10. *Oxyurichthys* p. 39.
      - *β'*. Teeth in upper jaw in two rows. 11. *Paroxyurichthys* p. 50.
      - *γ'*. Teeth in upper jaw in several rows.
        - 1. Head compressed, scaled above behind the eyes. L.l. 25-45 ctenoid scales. Isthmus moderate . . 12. *Acentrogobius* p. 52.
        - 2. Head compressed, scaled or naked above behind the eyes. L.l. 85-140 ctenoid or cycloid scales. Isthmus narrow . . . 13. *Cryptocentrus* p. 79.
        - 3. Head compressed, naked, nape partly scaled. L.l. 25-30 ctenoid scales . . 14. *Oligolepis* p. 92.
        - 4. Head compressed, scaled from above opercle. L.l. 28-30. Neck with a longitudinal dermal crest . . . . 15. *Cristatogobius* p. 94.
        - 5. Head depressed L.l. 25-75 cte-

noid or cycloid scales. Basal membrane of ventral fins weak or absent. On head ridges of papillae . . 16. *Callogobius* p. 96.

b'. Caudal fin shorter than head, obtuse, rounded or oblong.
  aa. Maxillary prolonged posteriorly.
    α. Body strongly compressed. L.l. 25-30 ctenoid scales. Head scaled above behind the eyes. D. 2 I. 6-7. 17. *Redigobius* p. 103.
    β. Body not strongly compressed.
      α'. Head naked. L.l. 30-40 ctenoid scales. D. 2 I. 10. . 18. *Waitea* p. 106.
      β'. Head scaled above behind the eyes. L.l. 25-30 ctenoid scales. D. 2 I. 6-8. 19. *Stigmatogobius* p. 108.
  bb. Maxillary not prolonged posteriorly.
    α. Barbels on head.
      α'. On each side of chin a barbel . . 20. *Illana* p. 128.
      β'. Ridges of papillae on head, which may have the appearance of barbels . . . . . . 16. *Callogobius* p. 96.
    β. No barbels on head.
      α'. Teeth in upper jaw in two rows.
        1. L.l. 25-32; D. 2 I. 8-11; A. I. 8-9 . . . . . 21. *Quisquilius* p. 129.
        2. L.l. 22-24; D. 2 I. 6-7; A. I. 5. 22. *Pandaka* p. 133.
        3. L.l. 50-75; D. 2 I. 13-16; A. I. 13-16 . . . . 23. *Amblygobius* p. 135.
      β'. Teeth in upper jaw in several rows

A. Basal membrane of ventral fins weak or absent.
  1. Rows of papillae on head. L.l. 25-30. Head scaled . . . . 16. *Callogobius* p. 96.
  2. Rows of papillae on head. L.l. ± 36. Head naked . . . 24. *Herreogobius* p. 144.
  3. No rows of papillae on head. L.l. 25-32. Head scaled above behind the eyes. Mouth oblique . . 21. *Quisquilius* p. 129.
  4. No rows of papillae on head. L.l. 23-28. Head scaled above behind the eyes. Mouth horizontal . 25. *Fusigobius* p. 146.
  5. No rows of papillae on head. L.l. 22-30. Head naked, body anteriorly naked . . . 26. *Zonogobius* p. 148.
  6. No rows of papillae on head. L.l. 50-75 . . . 23. *Amblygobius* p. 135.
B. Basal membrane of ventral fins normally developed.
  1. Tongue emarginate to bilobate.
    a. Some fleshy flaps

on inner edge of shouldergirdle. Snout longer than eye. 27. *Awaous* p. 150.

- *b*. Some fleshy flaps on inner edge of shouldergirdle. Snout not longer than eye . . . . 28. *Tamanka* p. 154.
- *c*. No fleshy flaps on inner edge of shouldergirdle.
    - a^1. Gillopenings continued forward below, isthmus narrow.
        - a^2. Head depressed, flat. Canine teeth present in both jaws . . . . . . 29. *Glossogobius* p. 161.
        - b^2. Head compressed. In lower jaw on each side one canine tooth . . . 30. *Gnatholepis* p. 168.
        - c^2. Head subcylindrical. No canine teeth . . . . . 31. *Weberogobius* p. 172.
    - b^1. Gillopenings continued forward below, gillmembranes united across the isthmus. . 32. *Cottogobius* p. 174.
    - c^1. Gillopenings not or nearly not continued forward below, isthmus moderate to broad.
        - a^2. Foremost scale on nape enlarged. L.l. 25-30. . . 19. *Stigmatogobius* p. 108.
        - b^2. Nape naked, head naked laterally . . . . 33. *Ctenogobius* p. 176.
        - c^2. Nape scaled, but foremost scale not enlarged. Upper rays of pectoral fin not silklike . . . . 12. *Acentrogobius* p. 52.
        - d^2. Nape scaled, but foremost scale not enlarged. Upper rays of pectoral fin silklike . . . . . 34. *Bathygobius* p. 183.
        - e^2. Nape more or less scaled. Opercle scaled with small cycloid scales. 28. *Tamanka* p. 154.
        - f^2. Nape scaled. Cheek and opercle scaled with ctenoid scales . . . . 35. *Hemigobius* p. 191.

2. Tongue rounded.
    - *a*. Cheek naked, opercle with large ctenoid scales. Head scaled above from a little behind eye with thin cycloid scales, which fall out readily. . . . . . . 36. *Brachygobius* p. 192.
    - *b*. Cheek naked, opercle with large cycloid scales. Head scaled

above behind the eyes. Body strongly compressed, high . . 17. *Redigobius* p. 103.

c. Cheek naked, opercle with large cycloid scales. Head scaled above behind the eyes. Body a little compressed, not high . . 19. *Stigmatogobius* p. 108.

d. Cheek and opercle scaled with large weakly ctenoid scales. Head scaled above behind the eyes . . . . 12. *Acentrogobius* p. 52.

e. Cheek and opercle with large cycloid scales.
  a^1. Isthmus narrow . . . . . 30. *Gnatholepis* p. 168.
  b^1. Isthmus broad. Foremost scale on nape not enlarged. 12. *Acentrogobius* p. 52.
  c^1. Isthmus broad. Foremost scale on nape enlarged . . 19. *Stigmatogobius* p. 108.

f. Cheek and opercle, if scaled, not with large scales.
  a^1. Some fleshy flaps on inner edge of shouldergirdle. Isthmus broad . . . . . 8. *Stenogobius* p. 33.
  b^1. Some fleshy flaps on inner edge of shouldergirdle. Isthmus moderate . . . . 28. *Tamanka* p. 154.
  c^1. No fleshy flaps on inner edge of shouldergirdle . .
    a^2. Isthmus narrow. L.l. about 70. Head naked. 37. *Cryptocentroides* p. 197.
    b^2. Isthmus broad or moderate.
      a^3. Head naked . . . 33. *Ctenogobius* p. 176.
      b^3. Head scaled above.
        a^4. Isthmus moderate. 28. *Tamanka* p. 154.
        b^4. Isthmus broad. . 12. *Acentrogobius* p. 52.

1. **Schismatogobius** De Beaufort

(De Beaufort, Zool. Anz. 39, 1912, p. 139 and Bijdragen Dierkunde 1913, p. 142).

Body elongate, compressed, naked. Head depressed. Eyes close together. Mouth a little oblique. Maxillary produced backwards to halfway preopercle. Teeth in several rows in both jaws, widely set, curved backwards at the tip. Isthmus broad. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 8-9. Ventral fins united. Caudal fin pointed.

Distribution: Indo-Australian Archipelago, Philippines.

1. **Schismatogobius bruynisi** Bfrt. (Fig. 3, p. 20)

Schismatogobius bruynisi De Beaufort, Zool. Anz. 39, 1912, p. 139. — Bijdragen Dierkunde 1913, p. 142, fig. 6, pl. 2 fig. 2.
Gobiosoma insignum Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 289, pl. 27 fig. 3.
Schismatogobius bruynisi Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 141, figs. 10, 11.
Gobiosoma insignum Koumans, Zool. Meded. Leiden 22, 1940, p. 192 (as synonym).

D. 1 VI; D. 2 I. 8-9; A. I. 8-9.

Body elongate, height 4-6 in length, more than 7 in total length. Head depressed, $3^1/_2$ in length, $4^1/_4$ in total length. Eye $3^2/_3$-5 in head, interorbital $^1/_4$ eyediameter. Snout pointed, about as long as eye. Mouth scarcely oblique, lower jaw prominent. Maxillary extends to halfway preopercle. Teeth in 3 rows, needle-like, curved backwards at the tip. In lower jaw the teeth extend to halfway the jaw. Tongue rounded to slightly notched. Gillopenings not continued forward below, isthmus broad. Head and body naked. First dorsal fin lower than body. Second dorsal fin in front as high as body. Anal fin a little lower. Pectoral fin pointed, as long as head without snout. Ventral fin a little shorter than pectoral fin. Caudal fin oblong. Colour yellow with brown reticulations. Below dorsal fins the reticulations are broad, black. and form two irregular transversal bands. End of caudal peduncle and beginning of caudal fin black. Caudal fin further with 3 yellow spots. Dorsal fins black, first fin with two, second fin with three longitudinal yellow bands. Anal fin yellow, darker at the base. Pectoral fin with irregular black band. Ventral fin with subterminal black stripe. Length 47 mm.

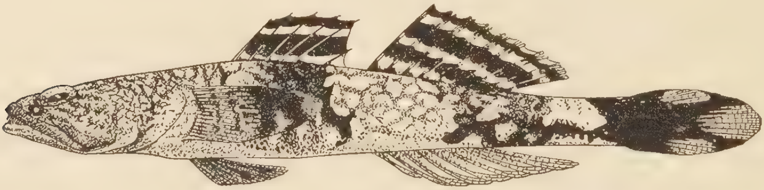

Fig. 3. *Schismatogobius bruynisi* Bfrt. × 2. After de Beaufort.

Habitat: ?Sumatra (Labuan Batu!); West Ceram (Honitetu river Eme!). — Philippines (Negros!), Luzon.

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS

Type of *Schismatogobius bruynisi* seen in the Amsterdam Museum, type of *Gobiosoma insignum* seen in Bureau of Science, Manila.

2. **Mars** Jordan & Seale

(Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 408).

Body elongate, compressed, covered with 54-65 scales, ctenoid posteriorly, cycloid anteriorly. Head scaled from a little behind the eye or naked. Snout a little shorter than eye. Mouth oblique. Teeth in several rows, small, sharp-pointed. Rather large blunt teeth on palatines and vomer. Some mucous canals radiate below the eye, crossed by longitudinal ones. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 10-12; A. I. 8-12. Ventral fins united. Caudal fin rounded.

Distribution: Singapore, Sulu Archipelago, Pelew Islands, Samoa.

1. **Mars caeruleo-maculatus** Herre

Mars caeruleo-maculatus Herre, Copeia 1933, p. 22.
Mars caeruleo-punctatus Herre, Notes on Fishes of Stanford Univ. 1, 1934, p. 87.
Mars caeruleo-maculatus Herre, Bull. Raffles Mus. 13, 1937, p. 45.
Mars coeruleo-maculatus Koumans, Zool. Meded. Leiden 22, 1940, p. 147.

D 1 VI; D. 2 I. 10; A. I. 9; L.l. about 65; L.tr. 16-18.

Body elongate, compressed, height 5 in length. Head 3½ in length. Eye 4.1 in head, interorbital $^1/_4$ eyediameter. Snout as long as eye, tip before inferior margin of eye. Mouth oblique. Teeth of outer row in upper jaw caniniform; behind this row there are 3 or 4 rows of very small teeth. In lower jaw 3-4 rows of small teeth, a small canine on each side; teeth of inner row laterally enlarged. Two large teeth on vomer, palatines toothless? Two longitudinal mucous canals on cheek, crossed by transversal ones. Scales of body ctenoid, smaller in front. Head and nape naked to origin of first dorsal fin. Fourth ray of first dorsal fin is the longest, a little higher than body. Second dorsal fin and anal fin a little lower than body. Basal membrane of ventral fins weakly developed. Colour olive brown with 7 darker transverse bands across back and sides. Body with blue spots, especially posteriorly. Head mottled. First dorsal fin with blackish stripe on its upper half or spines with rows of blackish spots. Second dorsal fin with 3 rows of oval dusky spots on the membrane. Anal and ventral fins blackish. Pectoral and caudal fin pale. Length 45 mm.

Habitat: Singapore, Sulu Archipelago (Jolo!). — Philippines, Pelew Islands. — In sea.

Type and paratypes of *Mars caeruleo-maculatus* seen in Stanford University.

3. **Intonsagobius** Herre

(Herre, Proc. Biol. Soc. Washington 56, 1943, p. 91).

Body elongate, covered with 24-30 scales, ctenoid posteriorly, becoming cycloid before first dorsal fin. Head broad, scaled above behind the eyes, naked on cheek and opercle. Eyes close together, interorbital much less than diameter of eye. Snout a little longer than eye. Anterior nostril in a long tube. Teeth in upper jaw in 5 rows, in lower jaw in 6 rows, outer row in both jaws enlarged. Tongue free, rounded. On vomer two broad incisors. Entire head with transverse and longitudinal fringed ridges with sensory papillae. Anterior part of body and at least central row of lateral scales to the caudal base with vertical rows of sensory papillae. Gill-openings not continued forward below, isthmus broad. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 9-10; A. I. 7-8. Ventral fins with a basal membrane, their rays fringed. Pectoral fin without free silklike rays, base scaled. Caudal fin rounded, more or less as long as head.

Distribution: Sulu Archipelago.

1. **Intonsagobius kuderi** Herre

Intonsagobius kuderi Herre, Proc. Biol. Soc. Washington 56, 1943, p. 93.

D. 1 VI; D. 2 I. 9; A. I. 7-8; L.l. 25-27; L.tr. 9; Predorsal scales 6.

Height of body 4-4.3 in length. Head about 3 in length. Eye projecting above the profile, 3.6-3.9 in head, interorbital 2.3-2.6 in eye. Snout broad, a little longer than eye, 3.3-3.4 in head. Mouth small. Lips thick. Maxillary scarcely reaches below anterior margin of eye. Teeth in upper jaw in 5 rows, outer row enlarged. In lower jaw teeth in 6 rows, outer row enlarged. On cheek there are 3-4 vertical and 2 transverse ridges, on opercle a vertical and 2 transverse or diagonal ridges. Short ridges on sides and top of snout and behind the eyes. On the side of nape and lower side of head, and on the median row of scales back to caudal base are rows of sensory papillae. A row of pores about upper half of eye, including two pores in interorbital space, additional pores in supra-opercular groove and posterior margin of preopercle. Scales as stated for the genus. Second ray of first dorsal fin is elongate, threadlike. The second dorsal fin is highest in its posterior half, about equal to height of body. Anal finrays longest posteriorly. Pectoral fin about as long as head. Ventral fins shorter than head. 3.9-4.3 in length. Height of caudal peduncle is 2.2-2.4 in head and 1.66-1.9 in its own length. Colour in alcohol according to HERRE: "uniform brown, with 3 or 4 obscure broad transverse bands of darker brown, the underside of the head paler. The dorsals, pectorals, and caudal are cross-barred by brown or blackish brown and whitish; the anal is dusky or with faint whitish crossbars; the ventrals are dusky, or may be marginally pale. Length 35 mm (standard length)."

Habitat: Near Jolo, Sulu Archipelago.

Note: Not seen by us.

4. **Smilogobius** Herre

(Herre, Notes on Fishes of Stanford Univ. 1, 1934, p. 88).

Body elongate, covered with 70-85 cycloid scales. Head naked or with a few small scales above opercle. Teeth in several rows, outer row enlarged, canine teeth present. In vomer two large, flat incisors. Tongue rounded. Head with mucous canals on top and sides. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 10; A. I. 9-10. Ventral fins united. Caudal fin rounded.

Distribution: Singapore, Sulu Archipelago, Philippines.

Note: *Smilogobius* is in its general appearance similar to *Cryptocentroides,* but has teeth in the vomer.

Key to the Indo-Australian species of Smilogobius

1. Body with 8 broad transverse bands. . . . 1. *S. inexplicatus* p. 25.
2. Body with 3 blackish transverse bands, and 11-12 white lines . . . . 2. *S. cinctus* p. 25.
3. Body with 7 or 8 bands running downward and forward. . . . . 3. *S. singapurensis* p. 26.

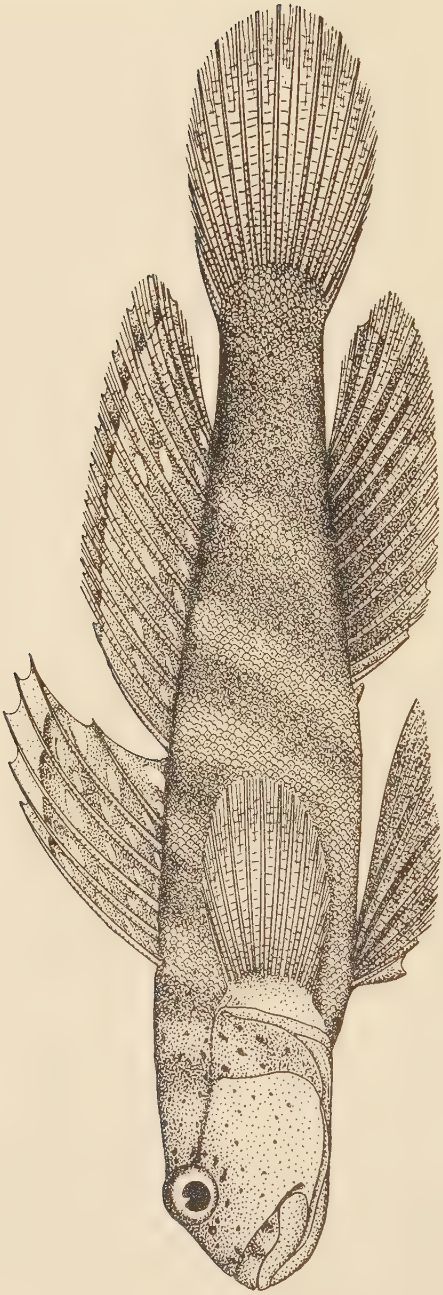

Fig. 4. *Smilogobius singapurensis* Herre. × $2^3/_{10}$. After Herre.

1. **Smilogobius inexplicatus** Herre.

Smilogobius inexplicatus Herre, Notes on Fishes of Stanford Univ. 1, 1934, p. 88.
Smilogobius inexplicatus Koumans, Zool. Meded. Leiden 22, 1940, p. 148.

D. 1 VI; D. 2 I. 10; A. I. 9; L.l. about 70; L.tr. about 20.

Body elongate, compressed, height 3.8 in length. Head compressed, 3.35 in length. Eye $4^1/_4$ in head, interorbital narrow. Snout $3^1/_3$ in head, tip below inferior margin of eye. Mouth oblique, jaws subequal. Lips thick. In upper jaw outer row of teeth enlarged, the 3 rows of teeth behind this row are very small. Two to three canines on each side in outer row. In lower jaw 3 rows of small teeth, on each side a canine. On vomer two large incisor-like teeth. Gill-openings a little continued forward below, isthmus moderate. Two longitudinal mucous canals on cheek, crossed by some canals radiating under eye. A pore medially of nostril. Two pores in median line in interorbital. Predorsal region naked. Third ray of first dorsal fin is the longest, longer than the height of body. Caudal fin rounded. Colour yellowish with 8 broad dusky transverse bands. The first two bands before dorsal are short, third and fourth below first dorsal fin, the rest below second dorsal fin. The third to eighth band are only developed on dorsal half of body. The first and second band are continued on cheek and opercle as rows of spots or bars. Two bars from eye to maxillary. Fins colourless, except the three foremost dorsal spines, which are tipped with bluish dusky. Length 71 mm.

Habitat: Sulu Archipelago (Sitankai!). — On reefs in sea.

Type and paratype of *Smilogobius inexplicatus* seen in Stanford University.

2. **Smilogobius cinctus** Herre

Smilogobius cinctus Herre, Bull. Raffles Mus. 12, 1936, p. 12, pl. 9.
Smilogobius cinctus Koumans, Zool. Meded. Leiden 22, 1940, p. 152.

D 1 VI; D. 2 I. 10; A. I. 9; L.l. 75; L.tr. 30.

Body elongate, height 4.6 in length. Head $3^1/_3$ in length. Eye 4.28 in head, interorbital very narrow. Snout as long as eye, tip below inferior margin of eye. Mouth oblique. Maxillary extends to beyond eye. The teeth are as described in *S. inexplicatus,* but the canines are very small, in female absent in lower jaw. Teeth in vomer much smaller than in the other species, they are coalesced along their inner edge into a single notched tooth. Fourth or fifth ray of first dorsal fin are the longest, lower than height of body. The membrane of last dorsal spine extends to base of first ray of second dorsal fin. Caudal fin oblong. Colour dusky brown with 3 blackish transverse bands. The first band is narrow, just before first dorsal fin and extends to base of pectoral fin. Second from base of sixth dorsal spine to anus, third band is broad, extending from second half of soft dorsal fin to halfway caudal peduncle to base of anal fin. From fourth dorsal spine to caudal base there are 11 or 12 white transverse lines. Between each pair of lines in middle of the side two circular white dots. Snout and opercle dark brown. Head spotted with dark brown, especially on lower side. First dorsal fin with 6 rows of white spots, oblong at the tip, circular at the base. Anal fin blackish. Second dorsal, pectoral and caudal fin clear or a little dusky, without markings. Ventral fin dark brown with black spots. Length 77 mm.

Habitat: Singapore Harbour!. — On reef.

Type of *Smilogobius cinctus* seen in Stanford University.

3. **Smilogobius singapurensis** Herre (Fig. 4, p. 24)

Smilogobius singapurensis Herre, Bull. Raffles Mus. 12, 1936, p. 13, pl. 10.
Smilogobius singapurensis Koumans, Zool. Meded. Leiden 22, 1940, p. 152.

D. 1 VI; D. 2 I. 10; A. I. 9-10; L.l. 75-80; L.tr. 32.

Body elongate, compressed, height 4.9 in length. Head $3^1/_2$ in length. Eye 5 in head, interorbital very narrow. Snout 3.1 in head, tip below inferior margin of eye. Mouth oblique. Maxillary extends to below posterior part of eye. Teeth as in *S. inexplicatus,* with one or two canines in upper jaw on each side, and one canine on each side in lower jaw. The large teeth in vomer are coalesced by the inner edge into a unit. Fourth dorsal spine is the longest, longer than height of body. Caudal fin broadly rounded. Colour creamy with 7 or 8 bluish plum coloured bands, running obliquely downward and forward. Nape and sides of head with dark blue ocelli, which extend on back along dorsal region and on the sides between second dorsal and anal fin to caudal base. In male, dorsal fins with blue ocelli, the posterior part of second dorsal, anal and ventral fin very dark blue. In female the fins are nearly colourless, ventral fins sometimes more or less dusky blue. In spirits the cross bands may disappear. Length 92 mm.

Habitat: Singapore Harbour!. — On reef.

Type and paratype of *Smilogobius singapurensis* seen in Stanford University.

5. **Actinogobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 319).

Body elongate, a little compressed, covered with about 70 ctenoid scales, becoming cycloid on neck and breast. Head a little depressed, scaled above behind the eyes, on preopercle a patch of scales at the posterior upper corner and a longitudinal stripe of scales halfway the preopercle. Upper half of opercle scaled. Bony interorbital about 1 diameter of eye. Snout 2 eyediameters. Mouth nearly horizontal, jaws subequal. Teeth in several rows, outer row enlarged; outer row of lower jaw extends to halfway the jaw, no canines. Tongue slightly bilobate. Gillopenings not very wide, about as long as the breadth of base of pectoral fin. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 9 rays. D. 2 I. 17-19; A. I. 14-17. Ventral fins united. Pectoral fins without free silklike rays, base scaled. Caudal fin obtuse.

Distribution: China, ? Java.

1. **Actinogobius ommaturus** (Rich.)

Gobius ommaturus Richardson, Zool. Voy. Sulphur, 1844, p. 147, pl. 55 figs. 1-4.
Gobius ommaturus Günther, Cat. Fishes 3, 1861, p. 77.
Gobius ommaturus Kner, Zool. Novara Fische 1865, p. 176.
Acanthogobius ommaturus Bleeker, Ned. Tijdschr. Dierk. 4, 1873, p. 128.

D. 1 (VIII?) IX; D. 2 I. 17-19; A. I. 14-17; P. 22; L.l. 70-80; L.tr. 16-17; Predorsal scales about 33.

Body very elongate, depressed anteriorly, compressed posteriorly, height about 8 in length. Head depressed, 3¾ to more than 4 in length. Profile nearly straight, descending in anterior half of snout abruptly downwards. Eye about 6 in head, interorbital about 1 eyediameter. Snout long, 2 eyediameters, tip below inferior margin of eye. Lips thick. Mouth horizontal. Jaws subequal to upper jaw prominent. Maxillary extends to below anterior half of eye. Teeth in several rows, outer enlarged. Outer row in lower jaw to halfway the jaw, no canines. Tongue scarcely bilobate. A mucous canal from nostrils to end of maxillary, where it is divided into two branches running longitudinally on cheek. Gillopenings a little continued forward below, isthmus moderate. Head scaled above behind the eye with cycloid scales; a patch of scales on posterior corner above on preopercle and some scales in a horizontal stripe halfway the cheek. Opercle scaled on upper half. Scales of body ctenoid, becoming cycloid anteriorly, on base of pectoral fin, breast and belly. First dorsal fin lower than body, second ray is the longest. Second dorsal fin about as high as body. Anal fin lower than body. Caudal fin oblong, a little shorter than head. Colour yellowish, a large dark spot at base of caudal fin, some smaller ones along middle of the sides. Dorsal fins and caudal fin with dark spots. Length 290 mm.

Habitat: Java (according to Kner). — China!.
I presume that the locality Java, stated by Kner, is an error.

6. **Oplopomus** (Ehrenberg) Cuvier & Valenciennes

(Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 66).

Centrogobius Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 321.
Hoplopomus Tate Regan, Trans. Linn. Soc. London 12, 1908, pp. 241, 242.

Body elongate, compressed, covered with about 24-30 ctenoid scales, which become cycloid on nape and breast. Head compressed, obtuse, scaled above behind the eyes, preopercle and opercle scaled or naked. Bony interorbital less than $^1/_2$ eyediameter. Snout obtuse,

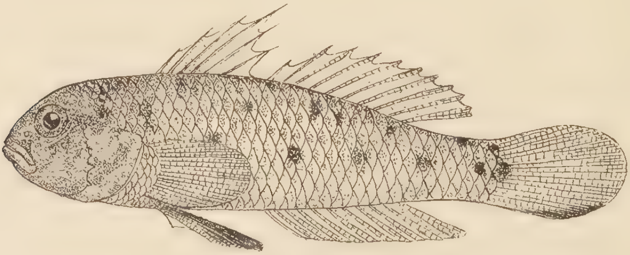

Fig. 5. *Oplopomus oplopomus* (C.V.). n.s.

shorter than eye. Nostrils not tubular. Mouth nearly horizontal, jaws subequal. Teeth in both jaws in several rows, the outer of which is enlarged. In lower jaw the outer row extends to halfway the jaw, the last teeth on each side are canines. Tongue truncate. Preopercle armed with one or two short spines at the lower end of the posterior margin. Gillopenings not very wide, isthmus moderate. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate, the first ray of both fins is strong, bony. First dorsal fin with 6 rays. D. 2 I. 8-10; A. I. 9-11. Ventral fins united, oblong. Pectoral fin without free silklike rays, base scaled. Caudal fin obtuse.

Distribution: Red Sea to the Pacific.

Note: In external resemblance this genus is close to *Acentrogobius,* e.g. *A. caninus* and *ornatus,* but differs at once in having the first ray of both dorsal fins pungent.

Key to the Indo-Australian species of Oplopomus

1. Cheek and opercle naked. Fourth and fifth ray of first dorsal fin filiform. Eye 3 in head. . . . 1. *O. oplopomus* p. 29.
2. Cheek and opercle scaled. No ray of first dorsal fin filiform. Eye 3½-4 in head . . . . 2. *O. caninoides* p. 31.

1. **Oplopomus oplopomus** (C.V.) (Fig. 5, p. 28)

Oplopomus pulcher Ehrenberg, Symbol. phys. ined. pl. 9 fig. 6.
Gobius oplopomus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 66.
Gobius bitelatus Cuvier & Valenciennes, o.c. p. 89.
Gobius notacanthus Bleeker, Nat. Tijdschr. Ned. Indië 15, 1858, p. 210.
Oplopomus notacanthus Steindachner, Sitz. ber. Ak. Wien 42, 1861, p. 290, pl. 1 fig. 2.
Gobius gemmatus (Heckel M.S.) Steindachner, o.c. p. 290.
Gobius oplopomus Günther, Cat. Fishes 3, 1861, p. 15.
Gobius bitelatus Günther, o.c. p. 35.
Gobius notacanthus Günther, o.c. pp. 35, 549.
Centrogobius notacanthus Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 321.
Gobius oplopomus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 170, pl. 90 fig. B.
Hoplopomus caninoides Regan, Trans. Linn. Soc. London 12, fasc. 3, 1908, p. 241 (pro parte).
Hoplopomus acanthistius Regan, o.c. p. 242, pl. 29 fig. 3.
Oplopomus oplopomus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 166, pl. 29 fig. 3.

Oplopomus oplopomus Fowler, Mem. B. P. Bishop Mus. 10, 1928, p. 412.
Oplopomus oplopomus Koumans, Zool. Meded. Leiden 20, 1937, p. 23.
Oplopomus oplopomus Koumans, Mem. Indian Mus. 13, 1941, p. 214.

D. 1 VI; D. 2 I. 9-10; A. I. 10; P. 18; L.l. 30; L.tr. 7-8; Predorsal scales 6-12.

Body elongate, compressed, height $4^1/_3$ in length, $5^1/_2$ in total length. Head compressed, $3^2/_3$ in length, $4^2/_3$ in total length. Profile convex. Eye 3 in head, interorbital $^1/_3$ eyediameter. Snout obtuse convex, shorter than eye, tip before inferior part of eye. Lips moderate. Mouth oblique, lower jaw a little prominent. Maxillary extends to below anterior part of eye. Teeth in upper jaw outer row enlarged. In lower jaw outer row enlarged, on each side a curved canine. Preopercle with two serrations at the posterior margin. Mucous canals longitudinal. In interorbital an open pore. Behind eye at the beginning of supraopercular groove an open pore. Head scaled from a little behind the eye, rest naked. Nape, breast and belly scaled. Scales of body ctenoid. Dorsal fins separate. First dorsal fin higher than body, first ray longer than eye, fourth and fifth ray prolonged. Second dorsal and anal fin about as high as body, pointed posteriorly. First ray of second dorsal fin is a pungent spine, which is not shorter than the pungent spine of first dorsal fin. Pectoral fin obtuse, rounded, shorter than head. Ventral fin acute. Caudal fin obtuse, obliquely convex, a little longer than head. Colour of upper parts reddish green, pearl-red below. Cheek and opercle with pearl like spots and short streaks, which are bordered with violet. Laterally a row of blackish spots. Each scale of body with some minute pearl like spots. Fins yellowish orange. First dorsal fin with oblique violet streak. Second dorsal fin with small ocelli. Pectoral fin with minute spots. Anal fin with short pearl-coloured streaks. Ventral fin posteriorly blackish. Base of anal fin blackish. Caudal fin in middle of base and halfway on upper rays some blackish spots. Length 79 mm.

Habitat: Singapore!; Pulu Weh!; Java (Surabaya!); Goram; Aru Islands; New Guinea (Skroë!). — Red Sea!, India!, Ceylon!, Maldives!, Philippines!, Pelew Islands, Tahiti. — In sea.

Specimen of Bleeker's collection seen in the Leiden Museum, type specimens of *Gobius bitelatus* seen in Paris Museum, type of *Hoplopomus acanthistius* seen in British Museum (N.H.).

2. **Oplopomus caninoides** (Blkr.)

Gobius caninoides Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 274.
Gobius caninoides Günther, Cat. Fishes 3, 1861, p. 36.
Gobius hoplopomus Regan, Journ. Bombay Nat. Hist. Soc. 16, 1905, p. 330.
Oplopomus vergens Jordan & Seale, Bull. Bur. Fisheries 26, (1906) 1907, p. 44, fig. 17.
Hoplopomus caninoides Regan, Trans. Linn. Soc. London 12, fasc. 3, 1908, p. 241 (pro parte).
Oplopomus vergens Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 168.
Oplopomus vergens Koumans, Zool. Meded. Leiden 22, 1940, p. 126 (as synonym).
Oplopomus caninoides Koumans, Mem. Indian Mus. 13, 1941, p. 215.

D. 1 VI; D. 2 I. 10; A. I. 10; P. 17-19; L.l. 30; L.tr. 7-8; Predorsal scales 12.

Body elongate, compressed, height $4^1/_4$-$4^3/_4$ in length, 5-6 in total length. Head obtuse convex, compressed, $3^4/_5$-4 in length, $4^2/_3$-5 in total length. Profile convex. Eye $3^1/_2$-4 in head, interorbital $^1/_3$ eyediameter. Snout obtuse convex, shorter than eye, tip before lower margin of eye. Lips moderate. Mouth oblique, lower jaw a little prominent. Maxillary extends to below anterior part of eye. Teeth in upper jaw of outer row enlarged. In lower jaw on each side a canine. Preopercle with 1-2 serrations. Longitudinal mucous canals. In interorbital an open pore. Behind each eye at beginning of supra-opercular groove an open pore. Head scaled above behind the eye, some rows of scales on cheek, opercle scaled. Scales of head, nape, breast and belly cycloid, other scales ctenoid. Dorsal fins separate. First dorsal fin lower than body, first ray about as long as eye, middle rays are the longest. Second dorsal fin and anal fin lower than body. First ray of second dorsal fin is a pungent spine, which is not shorter than the pungent spine of first dorsal fin. Pectoral fin obtuse, shorter than head. Ventral fin acute, a little shorter than head. Caudal fin obtuse, obliquely convex, shorter than head. Colour of upper part olivous-reddish green, lower parts greenish-pearl coloured. No pearl like spots on head. Laterally on body many blackish pearl like coloured points and blackish spots and a longitudinal row of larger blackish spots. First dorsal fin with 2 rows, second dorsal fin with 3 rows, caudal fin with 4-5 transversal rows. Fins yellowish. Dorsal fins and caudal fin with rows of black spots. Caudal fin posteriorly and base of anal fin violet. Base of caudal fin with three larger blackish spots in two vertical rows. Length 85 mm.

Habitat: Banka (Muntok); Celebes (Makassar, Badjoa); Buru (Kajeli); Ambon; Kei Islands (Tual!); Aru Islands.. — Gulf of Aden, Persian Gulf!, Philippines (Cavite!). — In sea.

Specimens of *Oplopomus caninoides* of Bleeker's collection seen in the Leiden Museum, type and cotypes of *Oplopomus vergens* seen in U.S. Nat. Museum and Stanford University.

Note: *Gobius* spec. mentioned by M. Weber, Siboga Expedition Fische, 1913, p. 271 from Stat. 258, Tual, Kei Islands, belongs to this species.

7. **Gladiogobius** Herre

(Herre, Copeia 1933, p. 23).

Body elongate, compressed, covered with about 24-30 ctenoid scales. Head compressed, naked, nape naked. Teeth in upper jaw in several rows, in lower jaw in two rows. Tongue rounded. Preopercle with a spur-like spine at the posterior angle. First dorsal fin with 6 rays. D. 2 I. 10; A. I. 9. Pectoral fin without free silklike rays. Ventral fins united at the base by a thin membrane, but free for most of their length. Caudal fin rounded.

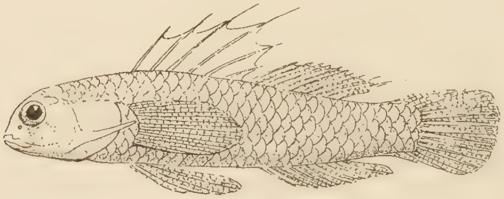

Fig. 6. *Gladiogobius ensifer* Herre. × 2.

Distribution: Indo-Australian Archipelago, Philippines.

Note: This genus form with *Quisquilius* a transition to the Eleotridae e.g. *Asterropteryx*. See note below last named genus.

1. **Gladiogobius ensifer** Herre (Fig. 6, p. 32)

Gladiogobius ensifer Herre, Copeia 1933, p. 23.
Gladiogobius ensifer Koumans, Zool. Meded. Leiden 22, 1940, pp. 147, 181

D. 1 VI; D. 2 I. 10; A. I. 9; L.l. 24-26; L.tr. 8.

Body elongate, height 4 in length. Head compressed, 3.65 in length. Eye 3 in head. Snout shorter than eye. Teeth and tongue as described for the genus. The preopercular spine extends to base of pectoral fin or to insertion of pectoral rays. Head naked, nape naked to dorsal fin. A low dermal crest is present in median line of nape. Tips of the rays of first dorsal fin elongated, especially of third and fourth ray, which are much longer than height of body. Colour brownish white, along the sides 5 dark brown blotches. Along the back brown bands and blotches. Nape and sides of body with small brown spots. Sides of head and base of pectoral fin with pearly white spots. A large blue-black spot above the upper angle of opercle, one at lower end of base of pectoral fin, a pair on breast, just behind the head. Fins colourless to dusky brown, with rows of pale spots. Ventral fins dark gray with a dark brown spot at the inner basal angle and a dark brown spot under the base of each fin. Length 48 mm.

Habitat: Bay of Djakarta (Island Haarlem!); Waigeu (Majalibit Inlet!). — Philippines (Culion!, Negros). — In sea.

Paratypes and cotypes of *Gladiogobius ensifer* seen in Stanford University.

8. **Stenogobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 317).

Body elongate, compressed, covered with 45-55 scales, which are ctenoid on most parts of body, becoming cycloid on neck and belly. Head compressed, obtuse, scaled above behind the eyes, rest of head generally naked, sometimes a patch of scales above on cheek and opercle. Bony interorbital $^1/_2$ eyediameter. Snout generally as long as eye, blunt. Nostrils not tubular. Mouth oblique, jaws subequal

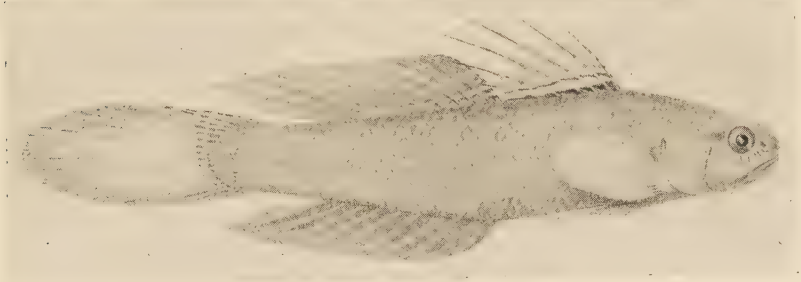

Fig. 7. *Stenogobius genivittatus* (C.V.). × $^2/_3$.

or lower jaw a little prominent. Teeth in both jaws in several rows, the outer is enlarged, pointed. Outer row of teeth in lower jaw extends only to halfway the jaw. No canines. Tongue truncate, not emarginate. Some transversal and longitudinal mucous canals on cheek. Gillopenings not very wide, isthmus broad. Inner edge of shouldergirdle with some fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 10-12; A. I. 10-12. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin obtuse to lanceolate.

Distribution: Madagascar, India, Japan to the Pacific.

Key to the Indo-Australian species of Stenogobius

1. Head and nape naked in median line. L.l. 11 1. *S. gymnopomus* p. 34.
2. Head and nape scaled in median line. L.tr. 12-14. 2. *S. genivittatus* p. 35.

1. **Stenogobius gymnopomus** (Blkr.)

Gobius gymnopomus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 270.
Gobius Richardsonii Bleeker, o.c. 5, 1853, p. 508.
Gobius gymnopomus Günther, Cat. Fishes 3, 1861, p. 65.
Stenogobius gymnopomus Koumans, Mem. Indian Mus. 13, 1941, p. 216.

D. 1 VI; D. 2 I. 10; A. I. 10; L.l. 50; L.tr. 11; Predorsal scales 18.

Body elongate, compressed, height $4^1/_2$-5 in length, 6-7 in total length. Head a little compressed, 4-$4^1/_3$ in length, 5-$6^1/_2$ in total length. Profile convex. Eye $3^1/_2$-4 in head, interorbital $^1/_2$ eye-diameter. Snout obtuse, about as long as eye or a little shorter, tip below inferior margin of eye. Anterior nostril in a rim. Jaws subequal. Maxillary extends to below middle of eye or not so far. Teeth of outer row enlarged. Cheek with transversal mucous canals under eye. On each side anteriorly in interorbital an open pore. An open pore behind each eye at the beginning of supraopercular groove. Head scaled above behind eye, but median line naked, rest of head naked. Nape in median line and breast naked. Scales of head, nape and belly cycloid, other scales ctenoid. First dorsal fin lower or higher than body, in male the middle rays are the longest. Second dorsal fin and anal fin lower or higher (in male) than body, pointed posteriorly. Pectoral fin about as long as head. Ventral fin about as long as head. Caudal fin rounded to lanceolate, longer than head. Colour of male reddish green above, yellow below. A broad violet band from eye to behind maxillary. Snout and cheek with irregular dark streaks. Back and sides with small dark spots. Laterally 3 transverse bands, curved backward. Base of first dorsal fin violet, outer half reddish with yellow spots, basal half with longitudinal oblique yellow stripe. Second dorsal, caudal and anal fin violet, basal half with violet spots, outer half with longitudinal rows of yellow spots, fins bordered with yellow. Pectoral fin yellowish, base above with dark spot. Ventral fin violet. Upper half of caudal fin with violet spots. Colour of female much weaker. Length 135 mm.

Habitat: Sumatra (Padang, Priaman); Java (Tjiringin); Ambon. — India (Travancore!). — In sea and estuaries.

Specimens of *Stenogobius gymnopomus* of Bleeker's collection seen in the Leiden Museum.

2. **Stenogobius genivittatus** (C.V.) (Fig. 7, p. 33)

Gobius genivittatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 64.
Gobius ophthalmoporus Bleeker, Nat. Tijdschr. Ned. Indië 5, 1853, p. 340.
Gobius Blokzeyli Bleeker, o.c. 22, 1861, p. 240.
Gobius genivittatus Günther, Cat. Fishes 3, 1861, p. 13.
Gobius ophthalmoporus Günther, o.c. p. 17.
Gobius polyzona Bleeker, Arch. neerl. sc. ex. et nat. 2, 1867, p. 413.
Gobius lacrymosus Peters, Monatsber. Ak. Berlin 1868, p. 265.
Gobius polyzona Bleeker, Recherches faune Madagascar 1874, p. 55.
Gobius genivittatus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 170, pl. 110 fig. C.
Gobius polyzona Sauvage, Hist. Nat. Poissons, Hist. de Madagascar 16, 1891, p. 370, pl. 40 fig. 3.
Gobius lacrymosus M. Weber, Zool. Ergebnisse 3, 1894, p. 412.
Gobius ophthalmoporus Steindachner, Abh. Senckenb. Naturf. Ges. 25, 1900, p. 429, pl. 17 fig. 1.
Awaous genivittatus Fowler, Proc. Ac. Nat. Sci. Philad. 1900, p. 517.
Awaous genivittatus Jordan & Evermann, Bull. U.S. Fish Comm. 23, (1903) 1905, p. 492, fig. 218.
Gobius beauforti M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 261.
?*Gobius zurstrassenii* Popta, Notes Leyden Mus. 34, 1911, p. 15.
Gobius ophthalmoporus M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 599.
Chonophorus genivittatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 211, pl. 16 fig. 4.
Chonophorus lachrymosus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 212, frontispiere.

Gobius ophthalmonema Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 405.
Chonophorus genivittatus Fowler, o.c. p. 409, pl. 42 fig. C.
Chonophorus beauforti Fowler, o.c. p. 410.
Gobius (Stenogobius) genivittatus Koumans, Zool. Meded. Leiden 13, 1930, p. 3.
Gobius polyzona Pellegrin, Mem. Ac. Malgache 14, 1933, p. 148, fig. 86.
Stenogobius genivittatus Koumans, Zool. Meded. Leiden 18, 1935, p. 124.
Stenogobius lacrymosus Hardenberg, Nat. Tijdschr. Ned. Indië 95, 1935, p. 238.
Chonophorus genivittatus Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 374.
Chonophorus lachrymosus Herre, o.c. p. 459.

D. 1 VI; D. 2 I. 10-11; A. I. 10-11; P. 15-16; L.l. 50-55; L.tr. 12-14; Predorsal scales 16-20.

Body elongate, compressed, height $3^3/_4$-6 in length. Head compressed, profile convex, $3^1/_2$-$4^1/_2$ in length. Eye 4-$5^1/_2$ in head, interorbital $^1/_2$-1 eyediameter. Anterior nostril in a very short tube. Snout blunt, a little shorter or longer than eye, tip below inferior margin of eye. Mouth oblique, jaws subequal. Maxillary extends to below anterior half of eye or not so far. Teeth of outer row enlarged. Below eye some oblique mucous canals, the second of these curved below and running longitudinally on cheek. On each side in interorbital space an open pore, behind each eye an open pore at the beginning of the supraopercular groove. Head scaled above behind the eyes and on upper parts of preopercle and opercle, in some specimens the cheek is fully scaled. Nape scaled in the median line. Scales of head and anterior part of body cycloid, of posterior part of body ctenoid. First dorsal fin as high as body, middle rays prolonged. Second dorsal fin pointed posteriorly. Anal fin similar to second dorsal fin. Pectoral fin obtuse, about as long as head. Ventral fin pointed, longer than head. Caudal fin oblong, longer than head. Colour greenish. Eight to twelve dark cross bars on each side of body. Each scale of the dorsal part of body with a vertical brown streak. A broad dark transversal band from eye downward to lower edge of preopercle, or not so far. First dorsal fin with some dark longitudinal stripes, second dorsal fin with streaks and spots in longitudinal rows. Central part of caudal fin dark, marginal parts reddish-violet. Pectoral fin yellowish, upper part of base of the fin with a dark stripe. Ventral fin blue to colourless. Anal fin reddish in male, bluish in female. Length 165 mm.

Nom. indig: Mile mile (Celebes), Belunguran (Samarinda).

Habitat: Bali (Djembrana!); ?Lombok (Sembalun); Borneo

(Samarinda!); Celebes (river Tjenrana near Pampanua!, Boni, Minralang!, river near Maros!); Morotai!; Ternate; Ceram!; Ambon!; Haruku (Wai Memi!); Salawati (Manoi); New Guinea (Bivak Island!, Mamapiri!, Klipong river!, Noord river!, Sepik river). — Madagascar!, Japan, Philippines!, to islands in the South Pacific. — In sea and rivers.

Types of *Gobius ophthalmoporus, blokzeyli* and *polyzona* seen in the Leiden Museum, type of *Gobius beauforti* seen in the Amsterdam Museum, type of *Gobius genivittatus* seen in Paris Museum, two specimens of *Gobius lacrymosus* from Luzon, Peters, seen in Paris Museum.

9. **Parachaeturichthys** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 325)

Body elongate, a little compressed, covered with about 30 ctenoid scales, breast and belly scaled (more or less cycloid?). Head subcylindrical to a little depressed, scaled on snout, above behind the eyes and on preopercle and opercle. Bony interorbital about $^1/_2$ eyediameter. Snout about as long as eye. Mouth oblique, lower jaw a little prominent. Ramus of lower jaw with many short barbels or only two barbels under chin. Teeth in both jaws in several rows, the outer one enlarged, caninoid. In lower jaw the outer row extends only to halfway the jaw. Tongue subtruncate. Gillopenings wide, not continued forward below, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. First dorsal fin with 6 rays. D. 2 I. 9-11; A. I. 9-10. Ventral fins united, oblong. Pectoral fin without free silklike rays, base scaled. Caudal fin pointed, much longer than head or about as long as head, with a black ocellus on the dorsal margin.

Distribution: East coast of South Africa, India, China, Japan, Ambon, North Queensland.

1. **Parachaeturichthys polynema** (Blkr.) (Fig. 8, p. 38)

Chaeturichthys polynema Bleeker, Verh. Gen. 25, 1853, p. 44, fig. 4.
Gobius polynema Günther, Cat. Fishes 3, 1861, p. 46.
Parachaeturichthys polynema Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 325.
Gobius polynema Day, Fishes India 1878, p. 286, pl. 61 fig. 8.
Gobius polynema Day, Fauna Brit. India Fishes 2, 1889, p. 252, fig. 89.
Parachaeturichthys polynemus Jordan & Snyder, Proc. U.S. Nat. Mus. 24, 1901, p. 103.

Parachaeturichthys polynemus Jordan & Seale, o.c. 28, 1905, p. 528.
Parachaeturichthys polynema McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 213.
Parachaeturichthys polynema Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 270, pl. 21 fig. 4.
Gobius (*Parachaeturichthys*) *polynema* Barnard, Ann. South Afric. Mus. 21, 1927, p. 826.
Gobius (*Parachaeturichthys*) *polynema* Wu, Contr. Biol. Lab. Sci. Soc. China Zool. Ser. 7, 1931, p. 42.
Parachaeturichthys polynema Koumans, Mem. Indian Mus. 13, 1941, p. 218.

D. 1 VI; D. 2 I. 9-10; A. I. 9; P. 20-21; L.l. 28-30; L.tr. 7-8; Predorsal scales 12-13.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-6 in length, 7-8 in total length. Head a little depressed, about 4 in length, $5^1/_2$-6 in total length. Profile convex. Eye $3^1/_3$-$3^1/_2$ in head, interorbital $^1/_3$-$^1/_2$ eyediameter. Snout obtuse, shorter than eye, tip before or a little below inferior margin of eye. Anterior nostril in a short tube. Mouth oblique, jaws subequal or lower jaw a little prominent. Maxillary extends to below middle of eye. Lower jaw with some short barbels under chin and numerous barbels on the ventral side of head in two longitudinal rows. Outer row of teeth in lower jaw enlarged, extends to halfway the jaw, last tooth is a weak canine. In upper jaw on each side in front 4-5 caninoid teeth. Tongue rounded to truncate. Three longitudinal mucous canals on cheek. An open pore behind each eye at the beginning of supraopercular groove. Two pores along this groove. One medially in interorbital space, 3 open pores on posterior margin of preopercle. Head scaled above between and behind the eyes, cheek and opercle totally scaled. Scales of head, nape, breast and belly cycloid, other scales ctenoid. Bases of dorsal fins subcontinuous. First dorsal fin lower than body, middle rays are the longest. Second dorsal fin and anal fin anteriorly lower than body, posteriorly higher and

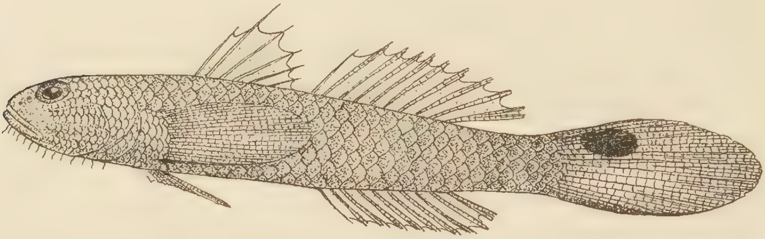

Fig. 8. *Parachaeturichthys polynema* (Blkr.) n.s.

pointed. Pectoral fin pointed, a little longer than head. Ventral fin a little shorter than head. Caudal fin lanceolate, much longer than head. Colour darkish green above, lighter below. Fins violet to purple. Caudal fin with black margin below, above at the base a large oblong ocellus, bordered with black and yellow. Length 150 mm.

Habitat: Ambon. — South Africa (Zululand), India!, Japan!, China, Formosa, North Queensland. — In sea.

Specimens of Bleeker's collection from Japan seen in the Leiden Museum.

10. **Oxyurichthys** Bleeker

(Bleeker, Act. Soc. Indo-neerl. 8, 1860, p. 44)

Apocryptes (*Gobiichthys*) Klunzinger, Verh. zool. bot. Ges. Wien 21, 1871, p. 479.
Oxyurichthus Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 324 (misprint).
Pselaphias Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 406.
Parapocryptes (*Paeneapocryptes*) Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 260.

Body elongate, compressed, covered with 30-100 scales, ctenoid on the posterior part of body, cycloid on the anterior part. Breast and belly scaled. Head compressed, neck more or less scaled, preopercle and opercle generally naked. Eye sometimes with a tentacle at the upper margin, bony interorbital about 1/4 eyediameter. Snout blunt, about as long as eye. Nostrils not tubular. Mouth oblique, lower jaw prominent. Teeth in upper jaw in one row, in lower jaw in 2-4 rows, sometimes inner row enlarged. Teeth of upper jaw strongly developed, caninoid, no true canines. Tongue rounded. Gillopenings not very wide, isthmus broad, in one species narrow.

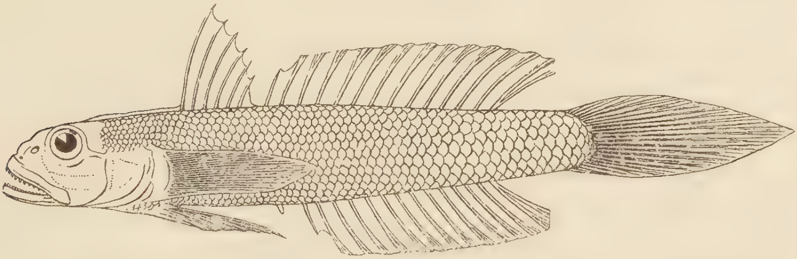

Fig. 9. *Oxyurichthys microlepis* (Blkr.) n.s. after Koumans.

Inner edge of shouldergirdle without fleshy flaps. First dorsal fin with 6 rays. D. 2 I. 10-13; A. I. 10-14. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin pointed, long.

Distribution: Red Sea, India to the Pacific.

Key to the Indo-Australian species of Oxyurichthys

1. 30-35 scales in L.l., 7-8 in L.tr.
    A. 30 scales in L.l., 7 in L.tr. Maxillary extends to below anterior half of eye. Gill-openings not continued forward below. . . 1. *O. jaarmani* p. 40.
    B. 35 scales in L.l., 8 in L.tr. Maxillary extends to below posterior $^1/_3$ of eye. Gill-openings continued forward below . . . . 2. *O. longimanus* p. 41.
2. 50-65 scales in L.l., 14-16 in L.tr.
    A. 50-55 scales in L.l. No tentacle on eye, but a black triangular spot in iris at the upper part . . . . 3. *O. microlepis* p. 41.
    B. 52-65 scales in L.l. At upper margin of eye a tentacle . . . . 4. *O. tentacularis* p. 44.
3. 70-80 scales in L.l., about 20 in L.tr.
    A. Nape in median line without scales, with a low crest . . . . 5. *O. papuensis* p. 46.
    B. Nape scaled in median line, with a very low crest . . . . 6. *O. auchenolepis* p. 49.

1. **Oxyurichthys jaarmani** M. Weber

Oxyurichthys Jaarmani M. Weber, Nova Guinea 9, Zool. 4, 1913, p. 601.
Oxyurichthus jaarmanni Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 415.

D. 1 VI; D. 2 I. 10; A. I. 11; P. 22; L.l. 30; L.tr. 7.

Body very elongate, compressed, height $5^{1}/_{3}$ in length. Head a little compressed, $3^{1}/_{2}$ in length. Profile convex. Eye $2^{4}/_{5}$ in head, interorbital very narrow. Snout about as long as eye, tip before inferior margin of eye. Mouth nearly horizontal, jaws subequal. Maxillary extends to below anterior half of eye. Teeth in upper jaw in one row, in lower jaw in some rows, outer enlarged. Gill-openings not continued forward below, isthmus moderate. In interorbital anteriorly and posteriorly in median line an open pore. An open pore behind each eye. Head naked. Scales of body ctenoid, becoming cycloid anteriorly. Nape naked?. Breast naked?. First and second rays of first dorsal fin prolonged. Caudal fin long, pointed, longer than head. Pectoral fin longer than head. Ventral fin a little shorter than pectoral fin. Colour in spirits brownish yellow. An indistinct dark spot at the base of caudal fin. Hinder margins of the scales narrowly bordered with black. Length 50 mm.

Habitat: New Guinea (Lorentz river!). — In estuary.

Type of *Oxyurichthys jaarmani* seen in the Amsterdam Museum.

2. **Oxyurichthys longimanus** (M. Weber) (Fig. 10, p. 42)

Gobius (Oxyurichthys) longimanus M. Weber, Notes Leyden Mus. 31, 1909, p. 154. — Siboga Exp. Fische 1913, p. 478, fig. 97.

D. 1 VI; D. 2 I. 9?; A. I. 12; L.l. 35; L.tr. 8.

Body very elongate, anteriorly a little compressed, posteriorly compressed, height 5 in length. Head $3^1/_3$ in length, a little compressed. Profile convex. Eye $2^1/_2$ in head, interorbital very narrow. Snout $^1/_2$ eyediameter, tip a little below the middle of eye. Mouth oblique, lower jaw a little prominent. Maxillary extends to below posterior $^1/_3$ of eye. Teeth in upper jaw in one row, enlarged, in lower jaw in some rows, outer enlarged. Tongue truncate. Gill-openings continued forward below, isthmus narrow. In interorbital anteriorly and posteriorly in median line an open pore. An open pore behind eye. Head naked. Nape naked before first dorsal fin. Breast scaled with cycloid scales. Scales of body ctenoid, becoming cycloid anteriorly. First and second rays of first dorsal fin prolonged. Caudal fin very long, about 2 times head. Pectoral fin about as long as head. Colour yellowish with 4 darker blotches in a longitudinal line along the middle of the side. Head with some pearl like spots on cheek, opercle and nape. Length 36 mm.

Habitat: Ceram Sea (2° 28'. 5 S, 131° 3'. 3 E!). — In sea 118 m deep.

Type seen in the Amsterdam Museum.

3. **Oxyurichthys microlepis** (Blkr.) (Fig. 9, p. 39)

Gobius microlepis Bleeker, Verh. Bat. Gen. 22, 1849, p. 35.
Gobius acutipennis var. Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1166.
Gobius microlepis Bleeker, Nat. Tijdschr. Ned. Indië 7, 1854, p. 436.
Oxyurichthys microlepis Bleeker, o.c. 14, 1857, p. 484.
Gobius microlepis Günther, Cat. Fishes 3, 1861, p. 49.

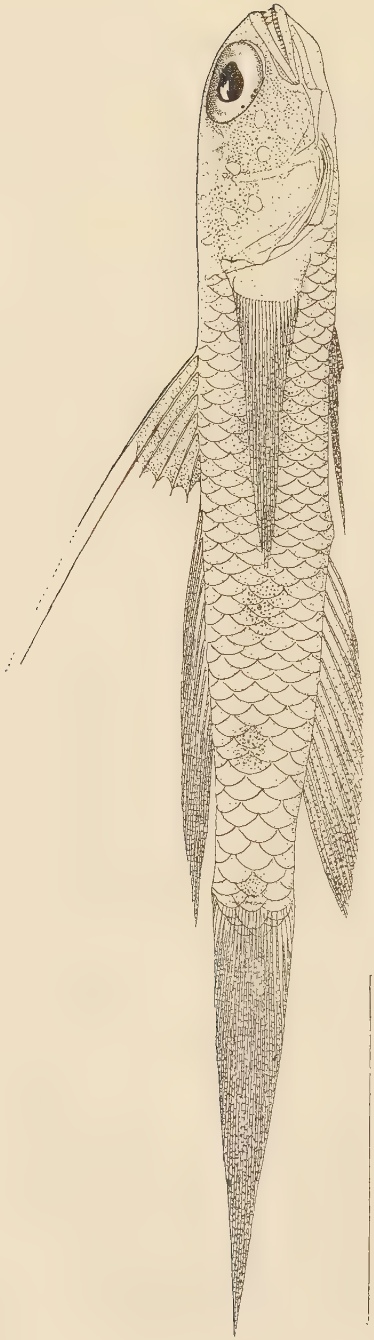

Fig. 10. *Oxyurichthys longimanus* (M. Weber). After M. Weber

Euctenogobius cristatus Day, Proc. Zool. Soc. London 1873, p. 109.
Gobius cristatus Day, Fishes India 1878, p. 291, pl. 62 fig. 8.
Gobius microlepis Day, o.c. Suppl. 1888, p. 793.
Gobius microlepis Day, Fauna Brit. India Fishes 2, 1889, p. 260.
Gobius cristatus Day, ibidem.
Gobiichthys microlepis Jordan & Seale, Proc. U.S. Nat. Mus. 29, 1905, p. 528.
?*Oxyurichthus cristatus* Jordan & Seale, Bull. Bur. Fisheries 26, (1906) 1907, p. 44.
Oxyurichthys microlepis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 251, pl. 20 fig. 2.
Euctenogobius cristatus Fowler & Bean, Proc. U.S. Nat. Mus. 71 art. 10, 1927, p. 11.
Gobius (Gobiichthys) microlepis Wu, Contr. Biol. Lab. Sci. Soc. China Zool. Ser. 7, 1931, p. 39.
Oxyurichthys microlepis Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 79.
Oxyurichthys microlepis Koumans, Zool. Meded. Leiden 18, 1935, p. 129, fig. 1.
Oxyurichthys microlepis Koumans, Mem. Indian Mus. 13, 1941, p. 221.

D. 1 VI; D. 2 I. 12; A. I. 13; P. 20-22; L.l. ± 55; L.tr. ± 14; Predorsal scales 17.

Body elongate, compressed, height $5^1/_4$-6 in length, $7^1/_3$-9 in total length. Head compressed, obtuse convex, 4-$4^1/_2$ in length, 6-$6^1/_2$ in total length. Eye $3^1/_2$-4 in head, interorbital $^1/_3$ eyediameter. No ocular tentacle. Snout convex, not longer than eye, tip below inferior margin of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw a little prominent. Maxillary extends to below posterior half of eye. Teeth in upper jaw curved, on each side 16-20. In lower jaw 2-3 rows, inner row in front enlarged. Tongue rounded. Longitudinal mucous canals on cheek. Anteriorly on each side of interorbital an open pore. Behind each eye an open pore at the beginning of supraopercular groove. Head scaled above behind the eye. Median line of head and nape naked, nape in median line with a low dermal crest. Scales of head and anterior part of body cycloid, on posterior part of body weakly ctenoid. First dorsal fin lower or higher than body, anterior to middle rays are the longest, the fourth mostly prolonged. Second dorsal fin and anal fin lower than first dorsal fin, pointed posteriorly. Pectoral fin rounded, a little longer than head. Ventral fin rounded, shorter than pectoral fin. Caudal fin lanceolate, about 2 times head. Colour green above, red pearl like below. On back and sides large violet blotches. Below eye and on scapula a violet to blue spot. Scales on back and sides with blue spots at the upper margin. Vertical fins red. First dorsal fin with two blue longitudinal streaks, rays with dark spots. Second dorsal fin with blue spots on the membrane, between the rays two transversal rows of blackish to violet spots. Pectoral fin orange, spotted below with violet. Ventral fin orange, in median part violet. Anal fin bordered with yellow and deep violet. Caudal fin bordered below with violet, upper part of membrane with numerous black spots, near margin oblique reddish violet streaks. A black triangular spot in iris at the upper part. Length 135 mm.

Nom. indig.: Belosso (Mal.), Puntang (Jav.), Bedul (Mad.).

Habitat: Singapore; Pulu Weh!; Sumatra (Labuan Batu!); Java (Djakarta!, Tandjung Priok!, Surabaja!, Tandjung Petjinan!, Japara); Madura (Sumanep); Sumbawa (Bima!); Borneo (Balikpapan bay!, Sandakan); Celebes (Makassar!). — India!, Colombo!, Penang!, Siam, China, Japan, Philippines. — In sea and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum, type of *Gobius acutipennis* var. seen in British Museum (N.H.), specimens of *Gobius cristatus* from collection Day seen in Calcutta Museum.

4. **Oxyurichthys tentacularis** (C. V.) (Fig. 11, p. 45)

Gobius tentacularis Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 128.
Gobius erythrinus (Kuhl & v. Hasselt) Cuvier & Valenciennes, ibidem.
Gobius macrurus Bleeker, Verh. Bat. Gen. 22, 1849, p. 35.
Gobius tentacularis Bleeker, Nat. Tijdschr. Ned. Indië 7, 1854, p. 434.
Gobius ophthalmonema Bleeker, o.c. 12, 1856-1857, p. 208.
Oxyurichthys tentacularis Bleeker, o.c. 14, 1857, p. 464.
Oxyurichthys ophthalmonema Bleeker, Act. Soc. Indo-Neerl. 6, 1859, p. 120.
Gobius tentacularis Günther, Cat. Fishes 3, 1861, p. 48.
Gobius ophthalmonema Günther, ibidem.
Euctenogobius ophthalmonema Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 180, pl. 111 fig. B.
Gobius tentacularis Day, Fishes India 1878, p. 291, pl. 64 fig. 4.
Gobius tentacularis Day, Fauna Brit. India Fishes 2, 1889, p. 261.
Pselaphias opthalmonema Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 406.
Oxyurichthus tentacularis Jordan & Seale, o.c. 26, (1906) 1907, p. 45.
Gobiichthys tentacularis Jordan & Richardson, o.c. 27, (1907) 1908, p. 278.
Gobius (Oxyurichthys) uronema M. Weber, Notes Leyden Mus. 31, 1909, p. 153.
Gobius (Oxyurichthys) tentacularis M. Weber, Siboga Exp. Fische 1913, p. 476 1).

---

1) Of the 7 specimens from Bima, Stat. 47 Siboga Exp., 5 specimens belong to this species. 2 specimens belong to *O. microlepis* (Blkr.).

Gobius (Oxyurichthys) uronema M. Weber, o.c. p. 477, fig. 95.
Oxyurichthys cornutus McCulloch & Waite, Rec. South Austral. Mus. 1, 1918, p. 80, pl. 8 fig. 2.
Oxyurichthys rumbia Popta, Zool. Meded. Leiden 7, 1922, p. 30.
Euctenogobius cristatus Fowler & Bean, Proc. U.S. Nat. Mus. 71 art. 10, 1927, p. 11 (not of Day).
Oxyurichthys ophthalmonema Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 257, pl. 20 fig. 3.
Oxyurichthys viridis Herre, o.c. p. 260.
Euctenogobius ophthalmonema Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 415.
Oxyurichthys tentacularis Koumans, Zool. Meded. Leiden 18, 1935, p. 126.
Oxyurichthys tentacularis Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 79.
Oxyurichthys cornutus Koumans, Zool. Meded. Leiden 22, 1940, p. 173 (as synonym).
Oxyurichthys viridis Koumans, o.c. p. 191 (as synonym).
Oxyurichthys tentacularis Koumans, Mem. Indian Mus. 13, 1941, p. 222.
Oxyurichthys tentacularis Koumans, in Blegvad & Løppenthin, Danish Sci. Inv. Iran prt 3, 1944, p. 163, fig. 94.

D. 1 VI; D. 2 I. 12; A. I. 13-14; P. 19-22; L.l. 52-65; L.tr. 14-16; Predorsal scales 17.

Body very elongate, compressed, height $5\text{-}5^3/_5$ in length, $7\text{-}7^1/_2$ in total length. Head obtuse, compressed, profile convex, 4-5 in length, 6-7 in total length. Eye $3^1/_4\text{-}4$ in head, interorbital $^1/_3\text{-}^1/_2$ eyediameter. At the upper margin of each eye a tentacle, which is about as long as eye. Snout obtuse, a little longer than eye or shorter than eye, tip before lower margin of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw prominent. Maxillary extends to below posterior part of eye. On each side 20 curved teeth in upper jaw; in lower jaw 2-3 rows, inner row enlarged. Some longitudinal mucous canals on cheek. An open pore on each side anteriorly in interorbital space, the open pore behind eye at the beginning of supraopercular groove is more or less distinct. Head scaled above behind eye, median line of head and nape naked. On nape a low

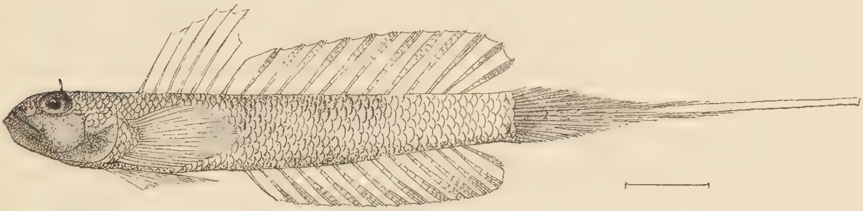

Fig. 11. *Oxyurichthys tentacularis* (C.V.). After M. Weber

dermal crest to insertion of first dorsal fin. Scales of head and anterior part of body cycloid, posteriorly ctenoid. First dorsal fin higher than body, anterior rays filiform, or lower than body. Second dorsal and anal fin lower than body, posteriorly pointed and increasing in height. Pectoral fin obtuse, about as long as head. Ventral fin about as long as head, basal membrane often fringed. Caudal fin lanceolate, about 2 times length of head. Colour reddish green above, reddish pearl-coloured below. Each scale of back and sides above with a round red spot at the margin. Below eye an oblong dark spot. First dorsal fin spotted with 3 longitudinal rows of reddish-violet spots. Second dorsal fin with 5-6 alternating longitudinal rows of oblong reddish-violet spots. Pectoral fin orange. Ventral fin and anal fin violet. Base of anal fin with a row of reddish-violet spots and with violet streaks along the blue border. Caudal fin yellowish, violet below, with oblique reddish-violet streaks. In the variety *ophthalmonema* Bleeker there are 5 round, dark spots laterally on body, placed in a longitudinal row; body moreover with many shiny spots. Length 145 mm.

Nom. indig.: Belosso (Mal.), Puntang (Jav.).

Habitat: Sumatra (Padang, Belawan!); Simalur (Sinabang bay!); Java (Djakarta!, Surabaja, Dirk de Vries Bay!, Tandjung Petjinan!); Madura! (Kammal); Bali (Den Pasar); Lombok (Labuan Tring!); Sumbawa (Bima!); Borneo (Sandakan!); Sulu Archipelago (Jolo); Celebes (Makassar!, Menado!, Rumbia); Ternate. — Gulf of Oman!, India!, Ceylon!, Andamans!, Indo China, Hongkong!, Formosa, Philippines!, Kandavu, Samoa, Tonga, Fiji Islands, Society Islands, Australia (Cairns!). — In sea and estuaries.

Types of *Gobius tentacularis* seen in Paris Museum, type of *Gobius ophthalmonema* seen in the Leiden Museum, types of *Gobius (Oxyurichthys) uronema* seen in the Amsterdam Museum, type of *Oxyurichthys cornutus* seen in South Australian Museum, type of *Oxyurichthys viridis* seen in Bureau of Science, Manila.

5. **Oxyurichthys papuensis** (C.V.) (Fig. 12, p. 47)

Gobius papuensis Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 106.
Gobius belosso Bleeker, Nat. Tijdschr. Ned. Indië 7, 1854, p. 316.
Oxyurichthys belosso Bleeker, o.c. 14, 1857, p. 464.
Gobius papuensis Günther, Cat. Fishes 3, 1861, p. 49.
Gobius belosso Günther, o.c. p. 50.

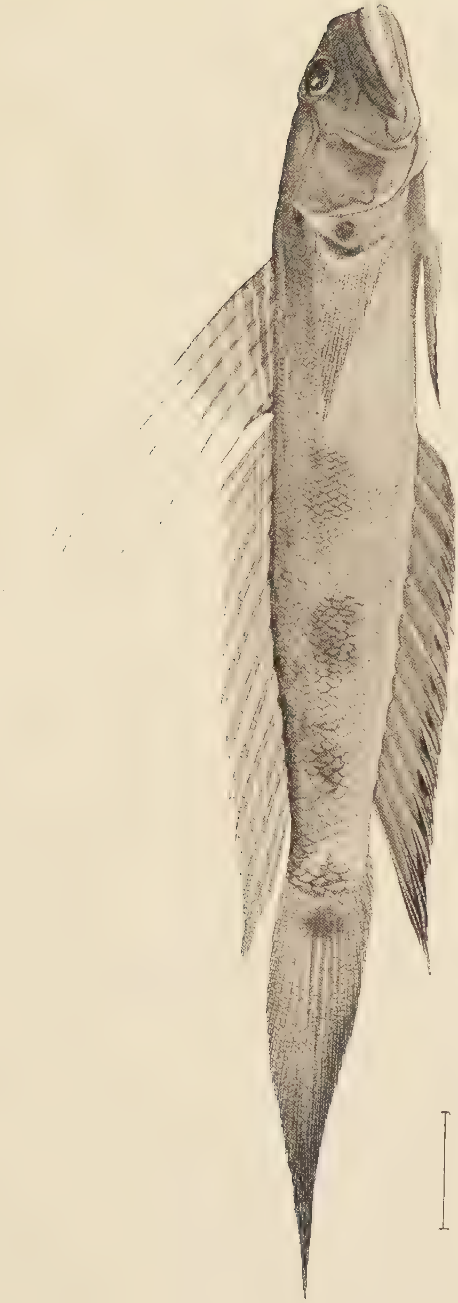

Fig. 12. *Oxyurichthys papuensis* (C.V.) × 1.6. After M. Weber

Oxyurichthys papuensis Bleeker, Arch. neerl. sc. ex. et nat. 13, 1878, p. 54.
Gobiichthys papuensis Jordan & Seale, Proc. U.S. Nat. Mus. 28, 1905, p. 796.
Gobius (Oxyurichthys) notonema M. Weber, Notes Leyden Mus. 31, 1909, p. 154.
Gobius (Oxyurichthys) papuensis M. Weber, Siboga Exp. Fische 1913, p. 476.
Gobius (Oxyurichthys) notonema M. Weber, o.c. p. 477, fig. 96.
Oxyurichthys amabilis Seale, Philipp. Journ. Sci. § D 9, 1914, p. 76, pl. 2 fig. 1.
Oxyurichthys amabilis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 250.
Oxyurichthys papuensis Herre, o.c. p. 253.
Oxyurichthys visayanus Herre, o.c. p. 254.
?*Oxyurichthys oculo-mirus* Herre, o.c. p. 256.
Parapocryptes (Paeneapocryptes) mindanensis Herre, o.c. p. 262, pl. 20 fig. 4.
Gobiichthys papuensis Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 415 (pro parte) .
?*Oxyurichthys papuensis* Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 79 (pro parte?).
Oxyurichthys amabilis Koumans, Zool. Meded. Leiden 22, 1940, p. 190 (as synonym).
Oxyurichthys visayanus Koumans, o.c. p. 190 (as synonym).
Oxyurichthys oculo-mirus Koumans, o.c. p. 190 (as synonym).
Parapocryptes (Paeneapocryptes) mindanensis Koumans, o.c. p. 191 (as synonym).
Oxyurichthys papuensis Koumans in Blegvad & Løppenthin, Danish Sci. Inv. Iran prt 3, 1944, p. 164.

D. 1 VI; D. 2 I. 12; A. I. 13; P. 21-23; L.l. 75-80; L.tr. 20; Predorsal scales 17-20.

Body very elongate, compressed, height 6-6$^1/_2$ in length, 8-10 in total length. Head obtuse, compressed, profile convex, 4-4$^1/_4$ in length, 5$^3/_4$-6 in total length. Eye 4 in head, interorbital $^1/_3$ or less than $^1/_3$ eyediameter. No ocular tentacle. Snout obtuse, about as long as eye, tip before or a little below inferior margin of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw prominent. Maxillary extends to below middle of eye, or to posterior part of eye. On each side 17-20 curved, pointed teeth in upper jaw. Teeth in lower jaw in 2-4 rows, the teeth of inner row enlarged and curved. Some longitudinal mucous canals on cheek. An open pore behind each eye at the beginning of the supraopercular groove. Head scaled above behind the eyes, median line of head and nape naked, nape with a low longitudinal dermal crest. Scales of head, nape and anterior part of body cycloid, on posterior part of body ctenoid. First dorsal fin lower than body, the rays are far prolonged beyond the membrane. Second dorsal and anal fin anteriorly lower than body, posteriorly higher than body. Pectoral fin rounded, about as long as head. Ventral fin pointed, about as long as pectoral fin. Caudal fin lanceolate, two times the length of head. Colour greenish above, reddish below. Body with many shiny spots and 8 indistinct transversal bands. Dorsal fins and caudal fin reddish with many blue streaks. Pectoral fin reddish with shiny spots, upper part of base with violet spot. Ventral fin reddish, outer part violet. Anal fin yellowish-red, violet towards the margin. A dark spot on caudal peduncle in middle of the side. Length 170 mm.

Nom. indig.: Belosso (Sundan).

Habitat: Singapore!; Pulu Weh!; Nias; Java (Djakarta!, Tjiringin); ?Timor (near Kupang!); ?Sulu Arch. (Jolo); Celebes (Lagusi, Menado!); Saleyer!; New Guinea!. — Persian Gulf!, Hongkong!, Philippines (Luzon!, Cebu!, Mindano!), Ponape, Hawaiian Islands. — In sea and estuaries.

Type of *Gobius papuensis* seen in Paris Museum, type of *Gobius belosso* seen in Leiden Museum, type of *Gobius* (*Oxyurichthys*) *notonema* seen in the Amsterdam Museum, type and cotypes of *Oxyurichthys amabilis*, type of *Oxyurichthys visayanus*, type and cotypes of *Oxyurichthys oculo-mirus*, type of *Parapocryptes* (*Paeneapocryptes*) *mindanensis* seen in Bureau of Science, Manila.

Note: *Oxyurichthys oculo-mirus* shows a club-shaped projection on the cornea of the eye, which is, however, sometimes only developed in one side of the animal.

6. **Oxyurichthys auchenolepis** Blkr.

Oxyurichthys auchenolepis Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 138.
Synechogobius heterolepidotus Koumans, Zool. Meded. Leiden 22, 1940, p. 133 (as synonym).

D. 1 VI; D. 2 I. 12; A. I. 13; P. 22-23; L.l. ± 80; L.tr. 20; Predorsal scales 18.

Height of body $5^1/_2$ in length, about 7 in total length. Maxillary extends to below middle of eye. Inner row of teeth in lower jaw not enlarged. Head and nape scaled in the median line. Nape with a very low median crest. Length 120 mm.

Habitat: Singapore!. — Japan?. — In sea.

Types of *Oxyurichthys auchenolepis* seen in the Leiden Museum, one specimen from Singapore, collected in 1934 seen.

Note: This species is closely allied, perhaps identical with *Oxyurichthys papuensis*. It differs in a few characters. Height of body $5^1/_2$ instead of $6^1/_2$. Maxillary to below middle of eye instead of to posterior part of eye. Inner row of teeth in lower jaw not enlarged. Head and nape scaled in the median line.

11. **Paroxyurichthys** Bleeker

(Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 140)

Body elongate, compressed, covered with 58-± 80 scales, ctenoid on the posterior part of the body, cycloid on the anterior part, breast and belly scaled. Head compressed, scaled above behind the eyes or naked, neck scaled, opercle scaled in the upper half or naked. Bony interorbital about $^1/_2$-1 eyediameter. Snout blunt, about as long as eye. Nostrils not tubular. Mouth oblique, lower jaw prominent. Teeth in upper jaw in 2-3 rows, the outer enlarged. In lower jaw teeth in 3-4 rows, no canines. Tongue truncate to slightly bilobate. Mucous canals not distinct. Open pores: one on each side of snout, one on each side behind eye, some on the upper and posterior margins of preopercle. Gillopenings not very wide, as long as the breadth of base of pectoral fin, isthmus wide. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 10-14; A. I. 10-15. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin much longer than head.

Distribution: Ambon, New Guinea.

Key to the Indo-Australian species of Paroxyurichthys

1. D. 2 I. 13; A. I. 14; L.l. about 80; L.tr. 16-17;
   Predorsal scales 35 . . . . 1. *P. typus* p. 50.
2. D. 2 I. 10; A. I. 10; L.l. about 60; L.tr 9;
   Predorsal scales 23. . . . . 2. *P. laterisquamatus* p. 51.

1. **Paroxyurichthys typus** Blkr. (Fig. 13, p. 51)

Paroxyurichthys typus Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 141.

D. 1 VI; D. 2 I. 13; A. I. 14; P. 17 L.l. ± 80; L.tr. 16-17; Predorsal scales 35.

Body elongate, compressed, height 7 in length, 9 in total length. Head compressed, $5^3/_5$ in length, 7 in total length. Profile convex. Eye $4^1/_2$ in head, interorbital less than $^1/_3$ eyediameter. Snout obtuse, a little shorter than eye. Mouth oblique, lower jaw prominent. Maxillary extends to below posterior part of eye. Teeth in upper jaw of outer row enlarged. In lower jaw teeth in 3-4 rows, outer row enlarged, no canines. Tongue slightly emarginate. Supraopercular groove distinct. Mucous canals longitudinally on cheek, but indistinct. Behind eye an open pore. Head scaled above behind the eye and on upper part of opercle with cycloid scales. Scales of body ctenoid, but anteriorly on nape, on breast and belly cycloid. First dorsal fin much lower than body, middle rays are the longest. Second dorsal and anal fin a little higher than first dorsal fin. Pectoral fin oblong, a little shorter than head. Ventral fin a little shorter than pectoral fin. Caudal fin much longer than head. Colour reddish-green above, pearly below. Fins yellowish to reddish, without spots or stripes. Length 114 mm.

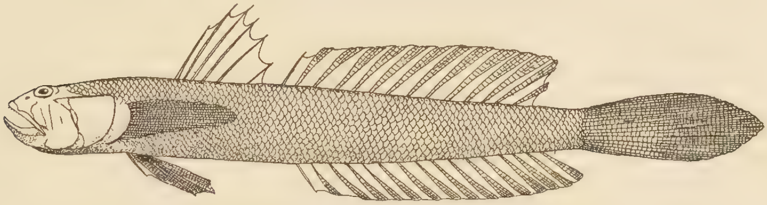

Fig. 13. *Paroxyurichthys typus* Blkr. × $^8/_9$

Habitat: Ambon!.

Type seen in the Leiden Museum.

2. **Paroxyurichthys laterisquamatus** (M. Weber)

Oxyurichthys laterisquamatus M. Weber, Nova Guinea 5, Zool. 2, 1908, p. 261.
Oxyurichthus laterisquamatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 415.

D. 1 VI; D. 2 I. 10; A. I. 10; P. 16; L.l. ± 60; L.tr. 9; Predorsal scales 23.

Body elongate, compressed, height about 6 in length. Head compressed, $4^1/_2$-$4^3/_4$ in length. Profile convex. Eye 5 in head, interorbital less than 1 eyediameter. Snout obtuse, longer than eye.

Mouth oblique, lower jaw prominent. Maxillary extends to below anterior margin of eye. Teeth small, brown, in upper jaw in 2-3 rows, the outer of which is enlarged. In lower jaw in 2-3 rows, outer enlarged. No canines. Tongue truncate. Gillopenings not continued forward below, isthmus moderate. Head scaled above behind the eye. Scales of cheek and opercle cycloid. Scales of body ctenoid, only the foremost scales of nape are cycloid. The rays of all fins are very prolonged. Caudal fin long, pointed. Colour yellow with very indistinct transverse bands. Dorsal fins and caudal fin with dark stripes. Upper part of base of pectoral fin with dark spot. Length 160 mm.

Habitat: New Guinea (river Mosso!).

Types seen in the Amsterdam Museum.

12. **Acentrogobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 321).

Porogobius Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 321.
Drombus Jordan & Seale, Proc. U.S. Nat. Mus. 28, 1905, p. 797.
Exyrias Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 405.
Creisson Jordan & Seale, o.c. 26, (1906) 1907, p. 43.
Opua E. K. Jordan, Proc. U.S. Nat. Mus. 66, 1928, p. 36.
Obtortiophagus Whitley, Rec. Austral. Mus. 19, 1933, p. 90.
Aulopareia H. M. Smith, Bull. 118 U.S. Nat. Mus., 1945, p. 534.

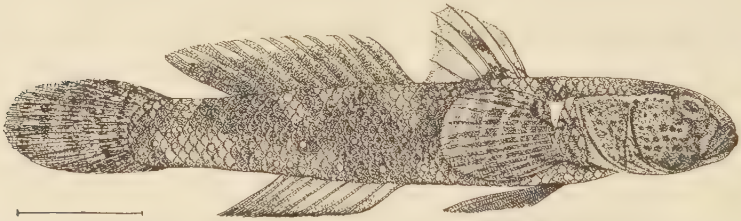

Fig. 14. *Acentrogobius bontii* (Blkr.) × $1^3/_5$. After M. Weber.

Body elongate, compressed, covered with 25-45 ctenoid scales, which become cycloid on nape, breast and belly. Head a little compressed, scaled above behind the eyes; preopercle and opercle totally scaled, scaled in the upper parts or naked. Bony interorbital more than to less than one eyediameter, in young specimens less than $^1/_2$ eyediameter. Snout obtuse, about as long as eye. Anterior nostril in a short tube. Mouth oblique, lower jaw prominent. Teeth in both jaws in several rows, the outer of which is enlarged, the inner one is also a little enlarged. In lower jaw outer row extends to halfway the jaw, the last teeth are recurved canines. In both jaws some caninoid teeth, larger than the rest. Tongue truncate to scarcely bilobate. Mucous canals longitudinally on cheek. Some open pores round the eyes and along upper and posterior margins of preopercle. Gillopenings not, or only a little continued forward below, isthmus moderate. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 6-17; A. I. 6-19. Ventral fins united, oblong. Pectoral fin without or with free silklike rays, base scaled. Caudal fin obtuse to pointed.

Distribution: West Africa, Red Sea to the Pacific.

Key to the Indo-Australian species of Acentrogobius

1. 35-36 scales in L.l. Lips thick. Caudal fin obtusely rounded. 10-14 scales in L.tr.
    A. 12 scales in L.tr., about 18 predorsal scales. Cheek and opercle naked. A rhombic naked area above behind eye. 1. *A. bontii* p. 54.
    B. 13-14 scales in L.tr., 18-20 predorsal scales. Cheek and opercle naked. Head scaled above behind the eye . . . . 2. *A. elberti* p. 55.
    C. 10 scales in L.tr., about 30 predorsal scales. Cheek and opercle scaled in the upper part. Head scaled above behind the eye. . . . . 3. *A. viridipunctatus* p. 56.
2. 30-32 scales in L.l. Lips thick. 7-10 scales in L.tr.
    A. 23-25 predorsal scales. Cheek naked, opercle scaled along upper margin. Interorbital in adult 1 eyediameter. . 4. *A. chlorostigmatoides* p. 58.
    B. 16-20 predorsal scales.
        a. Cheek and opercle scaled.
            a'. Interorbital less than ½ eye. diameter . . . . 5. *A. janthinopterus* p. 59.
            b'. Interorbital 1$^{1}/_{3}$ eyediameter . 6. *A. herrei* p. 61.
        b. Cheek naked, opercle scaled on upper part. Open pore behind eye. Scapula with blue spot . . . . . 7. *A. caninus* p. 61.
    C. 14 predorsal scales.
        a. D. 2 I. 8-9; A. I. 8; P. 15-16. No or small open pore behind eye. . . 8. *A. oligactis* p. 63.
        b. D. 2. I. 10; A. I. 8-9; P. 18-19. Large open pore behind eye. . . . 9. *A. cyanomos* p. 64.

- D. 6-11 predorsal scales.
  - *a*. Cheek and opercle scaled. 8-9 scales in L.tr.
    - *a'*. Caninus in lower jaw rudimentary. A. I. 9.
      - α. Predorsal scales 10 . . . . 10. *A. puntang* p. 66.
      - β. Predorsal scales 6-7 . . . . 11. *A. hendersoni* p. 68.
    - *b'*. Caninus in lower jaw developed. A. I. 11. . . . . 12. *A. cauerensis* p. 68.
  - b. Cheek and opercle naked. 7 scales in L.tr. . . . . 13. *A. goldmanni* p. 70.
- 3. 26-28 scales in L.l.
  - A. D. 2 I. 10-11; A. I. 8-9; 10-12 predorsal scales. . . . . 14. *A. ornatus* p. 71.
  - B. D. 2 I. 7-8; A. I. 6-7; 10-11 predorsal scales . . . . 15. *A. balteata* p. 73.
  - C. D. 2 I. 8; A. I. 8; about 8 predorsal scales . . . . 16. *A. decoratus* p. 74.
  - D. D. 2 I. 10; A. I. 9; 7-8 predorsal scales . . . . 17. *A. globiceps* p. 75.
  - E. D. 2 I. 7; A. I. 6; 7 predorsal scales. 18. *A. leptochilus* p. 76.
  - F. D. 2 I. 8; A. I. 8; 12 predorsal scales 1) . . . . 19. *A. reichei* p. 77.

1. **Acentrogobius bontii** (Blkr.) (Fig. 14, p. 52)

Gobius Bontii Bleeker, Verh. Bat. Gen. 22, 1849, p. 27.
Gobius (*nox* Blkr?) M. Weber in Semon, Zool. Forschungsreisen 5, 1895, p. 269 (not of Blkr.).
Gobius triangularis M. Weber, Notes Leyden Mus. 31, 1909, p. 150. — Siboga Exp. Fische 1913, p. 464, fig. 91.
Aparrius moloanus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 207, pl. 16 fig. 3.
Ctenogobius triangularis Herre, Notes on Fishes of Stanford Univ. 1, 1934, p. 86.
Ctenogobius waigiensis Herre, Field Mus. N.H. Zool. 18 no. 12, 1935, p. 424.
Oligolepis moloanus Herre, Philipp. Journ. Sci. 59 no. 3, 1936, p. 369.
Acentrogobius bonti Koumans, Zool. Meded. Leiden 18, 1935, p. 123.
Ctenogobius waigiensis Koumans, o.c. 22, 1940, pp. 139, 155 (as synonym).
Aparrius moloanus Koumans, o.c. p. 187 (as synonym).
Acentrogobius bontii Koumans, Mem. Indian Mus. 13, 1941, p. 225.

D. 1 VI; D. 2 I. 9-11; A. I. 8-10; P. 17-19; L.l. ± 36; L.tr. 12; Predorsal scales ± 18.

Body elongate, anteriorly subcylindrical, posteriorly compressed; height $4^{3}/_{4}$-5 in length, 6-$6^{1}/_{2}$ in total length. Head obtuse, about as high as broad, profile convex, $3^{1}/_{2}$-4 in length, $4^{1}/_{2}$-5 in total length.

---

1) From these 12 predorsal scales the foremost 9-10 fall out readily.

Eye $3^1/_2$ in head, interorbital less than $^1/_2$ eyediameter. Snout obtuse, shorter than eye, tip before inferior margin of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below middle of eye or not so far. Lips thick. Teeth filiform, in many rows, outer enlarged; in lower jaw on each side 2 curved canines. Tongue rounded. Two or three longitudinal mucous canals on cheek, crossed by transversal ones. Some open pores round the eyes, one behind each eye at the beginning of supraopercular groove. Head naked above behind the eyes, the scales beginning from above the opercle. Scales of nape, breast and belly cycloid, on body ctenoid. First dorsal fin higher than body, second and third rays filiform (only in the male?). Second dorsal fin lower than body, pointed posteriorly. Anal fin similar to second dorsal fin. Pectoral fin obtuse, without free silklike rays. Basal membrane of ventral fin ending laterally in a free, pointed lobe. Colour reddish-green above, lighter below; laterally on posterior part of body 5-7 dark spots in a longitudinal line. Dorsal fins with dark spots on base. Anal fin with dark margin. Caudal fin with irregular spots.

In the variety *triangularis* M. Weber, the body has indistinct dark blotches and some silvery spots. At the upper part of base of pectoral fin a light triangular spot. Length 72 mm.

Nom. indig.: Ikan puntang (Jav. Surabaja).

Habitat: Java (Surabaja!); Strait Madura!; Sumbawa (Bima!); ?Timor (Kupang!) Kambang near Timor!; Sulu Arch. (Jolo!); Tukang besi Islands (Kaledupa!); Ambon!; Aru Islands (Manumbai!); Waigeu (Majalibit Inlet!). — India!, Andamans!, Philippines!, Ponape!. — In sea and rivers.

Type of *Gobius bontii* seen in the Leiden Museum, types of *Gobius triangularis* seen in the Amsterdam Museum, type and paratypes of *Ctenogobius waigiensis* seen in Field Museum N.H., paratype *of C. waigiensis* seen in Stanford University, type of *Aparrius moloanus* seen in Bureau of Science, Manila.

2. **Acentrogobius elberti** Popta

Acentrogobius elberti Popta, Zool. Meded. Leiden 6, 1921, p. 209.

D. 1 VI; D. 2 I. 10; A. I. 8-9; P. 17; L.l. 35; L.tr. 13-14; Predorsal scales 18-20.

Body elongate, compressed, height $5^5/_9$-$6^2/_{11}$ in total length. Head depressed, $3^7/_9$-$4^1/_6$ in total length. Eye 4-$4^1/_2$ in head, close together. Anterior nostrils tubular. Lower jaw a little prominent. Maxillary extends to below front margin of eye. Teeth in both jaws in a band, outer row a little enlarged and caninoid in front. The outer row in lower jaw extends to halfway the jaw, the last tooth is a curved canine. Tongue not emarginate. On head a few open pores: one before and one behind the eye in interorbital space; one near posterior nostril, one behind eye, some along posterior margin of preopercle. Scales ctenoid, becoming cycloid on nape, breast and belly. Head scaled above behind the eyes. Second dorsal fin inserted a little before insertion of anal fin. Caudal rounded, $^5/_6$ of length of head. Pectoral fin rounded, as long as caudal fin. Ventral fins united, inserted below pectoral fin, not reaching anus, basal membrane well developed. Colour in spirits brown. First dorsal fin with darker upper half. Second dorsal fin with light margin. Anal fin dark. Caudal fin with light transverse stripes. Pectoral fin with dark transverse band at the base. Ventral fin dark with light margin. Length 50 mm. Not seen by us.

Habitat: Muna (Raha). — In brackish water.

Note: This species is close to, perhaps identical with *A. bontii* (Blkr.).

3. **Acentrogobius viridipunctatus** (C.V.)

Gobius viridipunctatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 62.
Gobius venenatus Cuvier & Valenciennes, o.c. p. 85.
Gobius chlorostigma Bleeker, Verh. Bat. Gen. 22, 1849, p. 27.
Gobius viridipunctatus Günther, Cat. Fishes 3, 1861, p. 24.
Gobius venenatus Günther, o.c. p. 35.
Acentrogobius chlorostigma Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 321.
Gobius viridipunctatus Day, Fishes India 1878, p. 286, pl. 59 fig. 5, pl. 61 fig. 4, ?pl. 63 fig. 4.
Gobius viridipunctatus Day, o.c. Suppl. 1888, p. 793. — Fauna Brit. India Fishes 2, 1889, p. 253.
Gobius (venenatus C.V. affinis) M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 261.
Gobius viridipunctatus M. Weber, Siboga Exp. Fische 1913, p. 465.
Rhinogobius viridi-punctatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 179, pl. 30 fig. 1.
Gobius viridipunctatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 405.
Acentrogobius viridipunctatus Koumans, Zool. Meded. Leiden 18, 1935, p. 134. — o.c. 19, 1937, p. 178. — Mem. Indian Mus. 13, 1941, p. 226.

D. 1 VI; D. 2 I. 10; A. I. 9; P. 18-20; L.l. 35-36; L.tr. 10; Predorsal scales ± 30.

Body elongate, anteriorly subcylindrical, posteriorly compressed, height 4-$5^1/_2$ in length, 5-7 in total length. Head a little compressed, obtuse, $3^1/_3$-4 in length, $4^2/_3$-5 in total length. Profile convex. Eye 4-5 in head, interorbital less than $^1/_2$ to less than 1 eyediameter. Snout obtuse, shorter than eye, tip before or below inferior margin of eye. Nostrils tubular. Mouth oblique, lower jaw prominent. Maxillary extends to below middle of eye. Lips moderate. Teeth filiform, in many rows, outer row enlarged, anterior teeth caninoid. In lower jaw on each side 2-4 canines; outer row extends to halfway the jaw. Sometimes a canine of inner row on each side in front of the jaw. Mucous canal from nostril to edge of mouth, longitudinal canals on cheek, crossed by transversal ones radiating under eye. An open pore medially in interorbital, open pores in supraopercular groove, the first behind eye is the largest. Head scaled above behind eye and on upper part of preopercle and opercle with cycloid scales. Scales of nape, breast and belly cycloid, other scales ctenoid. First dorsal fin much lower than body, middle rays are the longest. Second dorsal and anal fin pointed posteriorly, a little higher than first dorsal fin. Pectoral fin without free rays, obtuse, not shorter than head without snout. Ventral fin obtuse, about as long as pectoral fin. Caudal fin oblong, a little or not shorter than head. Colour blackish green, laterally dotted over with bluish green spots, halfway the side a longitudinal row of larger dark spots. Scales with small shiny spots. Fins yellowish orange. Base of first dorsal fin with blackish longitudinal stripe. Second dorsal fin with green spots. Ventral fin blackish. Base of anal fin green, margin violet. Caudal fin with blackish spots on membrane, upper part of base without black spot. Length 165 mm.

Nom. indig.: Ikan puntang (Jav. Surabaja).

Habitat: Singapore!; Pulu Weh!; Banka (Muntok); Sumatra (Belawan!); Java (Djakarta!, Surabaja!, Pasuruan, Tjilatjap!); Madura (Kammal, Pamekasan!); Flores!; Borneo (Pamangkat, Sandakan, Krapu!); Celebes (Makassar!); Ambon; New Guinea (Merauke river!). — Zanzibar, Dar Es Salaam!, India!, Andamans!, Siam!, China, Hongkong, Riu Kiu Islands, Philippines! — In sea and estuaries.

Types of *Gobius viridipunctatus* and *venenatus* seen in Paris

Museum, specimens of Bleeker's collection seen in the Leiden Museum.

Note: The specimen mentioned from Dar Es Salaam by Fowler, New England Zoöl. Club 15, 1935, p. 50 as *Rhinogobius viridi-punctatus,* does not belong to this species.

4. **Acentrogobius chlorostigmatoides** (Blkr.)

Gobius unicolor Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 88 (not of Kuhl & v. Hasselt).
Gobius chlorostigmatoides Bleeker, Verh. Bat. Gen. 22, 1849, p. 26.
Gobius phaiomelas Bleeker, o.c. p. 28.
Gobius chlorostigmatoides Günther, Cat. Fishes 3, 1861, p. 39.
Gobius phaiomelas Günther, o.c. p. 42.
Rhinogobius atripinnatus H. M. Smith, Proc. U.S. Nat. Mus. 79 (1931) 1932, p. 45.
Acentrogobius chlorostigmatoides Koumans, Zool. Meded. Leiden 18, 1935, p. 135.
Rhinogobius atripinnatus Koumans, o.c. 22, 1940, p. 130 (as synonym).

D. 1 VI; D. 2 I. 10; A. I. 9; P. 18-19; L.l. 30-32; L.tr. 9-10; Predorsal scales 23-25.

Body elongate, anteriorly subcylindrical, posteriorly compressed, height $4^1/_3$-5 in length, $5^1/_2$-6 in total length. Head obtuse, $3^1/_2$-$3^3/_4$ in length, $4^2/_3$-$4^3/_4$ in total length. Profile convex. Eye $4^2/_3$-$5^1/_2$ in head, interorbital in young specimens $^1/_2$ eyediameter, in adult 1 eyediameter. Snout obtuse convex, shorter than eye, tip before lower margin of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw prominent. Maxillary extends to below posterior part of eye. Teeth in upper jaw of outer row enlarged. In lower jaw laterally two canines. Longitudinal mucous canals on cheek. In interorbital no open pore. Supraopercular groove with open pores, the first behind eye is the largest. Head scaled above behind eye and on upper part of opercle with cycloid scales. Scales of nape, breast and belly cycloid, other scales ctenoid. First dorsal fin lower than body, middle rays are the longest. Second dorsal fin and anal fin pointed posteriorly, in adult last rays prolonged. Pectoral fin obtuse, without free rays, not shorter than head without snout. Ventral fin obtuse, about as long as pectoral fin. Caudal fin obtuse, about as long as head. Colour blackish to blackish-green above, lighter below. Scales with many shiny green spots. Fins reddish orange. Second dorsal fin with 3-4 ocelli between the rays. Second dorsal, anal and caudal fin with black spots. Vertical fins often dark. A blackish spot at upper side of base of caudal fin. Length 88 mm.

Nom. Indig.: Ikan Puntang (Jav. Surabaja).

Habitat: Singapore; Pulu Weh!; Sumatra (Belawan!); Java (Djakarta!, Surabaja); Madura (Kammal); Borneo (Sinkawang). — Siam (Gulf of Siam!, Tachin river), China (Heungchow!). — In rivers and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum, specimen of *Gobius unicolor* Cuvier & Valenciennes from Java, Kuhl & v. Hasselt seen in Paris Museum, type of *Rhinogobius atripinnatus* seen in U. S. Nat. Museum.

5. **Acentrogobius janthinopterus** (Blkr.) (Fig. 15, p. 60)

Gobius janthinopterus Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 702.
Gobius hemigymnopomus Bleeker, Arch. Soc. Indo-neerl. 1, 1856, p. 50.
Gobius hemigymnopomus Günther, Cat. Fishes 3, 1861, p. 20.
Creisson validus Jordan & Seale, Bull. Bur. Fisheries 26, (1906) 1907, p. 43, fig. 16.
Creisson validus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 139, pl. 10 fig. 1.
Drombus halei Whitley, Rec. Austral. Mus. 5 no. 3, 1935, p. 353, figs. 4-5.
Creisson validus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 71, fig. 23.
Creisson validus Koumans, Zool. Meded. Leiden 22, 1940, p. 145 (as synonym).
Drombus halei Koumans, o.c. p. 173 (as synonym).

D. 1 VI; D. 2 I. 10; A. I. 8; P. 16-17; L.l. 32; L.tr. 9; Predorsal scales 17-20.

Body elongate, compressed, height 4-5 in length, 5-6 in total length. Head a little compressed, obtuse, $3^1/_2$-4 in length, $4^1/_2$-5 in total length. Profile convex. Eye $3^1/_2$-4 in head, interorbital less than $^1/_2$ eyediameter. Snout obtuse, shorter than eye, tip before lower margin of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below anterior margin of eye. Teeth in upper jaw of outer row enlarged. In lower jaw outer row on each side with a curved canine, inner row a little enlarged? Longitudinal mucous canals on cheek. Medially in interorbital an open pore. Supraopercular groove with distinct pores. Head scaled above behind eye. Preopercle and opercle scaled on upper half with cycloid scales. Scales of cheek in two bands, upper band with several rows of scales, lower band with two rows of scales. Scales of nape, breast and anterior part of belly cycloid, on posterior part of belly and other scales ctenoid. First dorsal fin about as high as body, middle rays, or the foremost rays in male filiform. Second dorsal fin a little lower than body, posteriorly pointed. Anal fin similar to second dorsal fin. Pectoral fin without free rays, longer than head without snout. Ventral fin obtuse, about as long as pectoral fin. Caudal fin obtusely rounded, about as long as head. Colour blackish green to olive green above, lighter below. Head mostly with 2-3 dark streaks from snout to eye, a streak from eye to opercle and one from maxillary to opercle. Laterally many irregular dark spots, in middle of the sides in a longitudinal row, arranged and similar to a band. Scales laterally with many shiny green spots. Finmembranes violet.

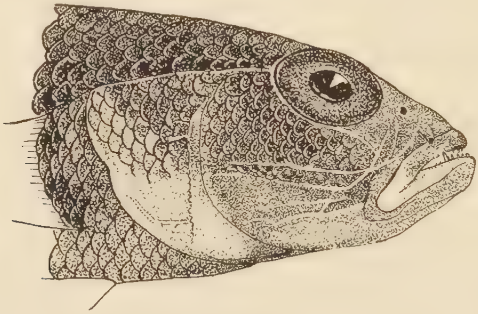

Fig. 15. *Acentrogobius janthinopterus* (Blkr.). × 3.

First dorsal fin with 2-4 black spots and halfway a longitudinal band. Second dorsal fin with 2-3 longitudinal rows of blackish spots. Caudal fin especially on upper half with blackish spots. On base of pectoral fin two short longitudinal streaks. Anal fin with black spots. Length 125 mm.

Habitat: Singapore; Banka (Marawang); Biliton (Tjirutjup); Sumatra!; Simalur (Sinabang!); Java (Dirk de Vries bay!); Flores (Riung!); Adonare (Badju!); Borneo (Balikpapan!, Bontang!); Sulu Arch. (Jolo!); Celebes (Makassar); Muna (La Punda!); Halmahera!; Batjan (Labuha); Ceram (Wahai). — Japan, Philippines (Cavite!), Australia (Flinders Island!). — In sea and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum, type of *Creisson validus* seen in Stanford University, holotype of *Drombus halei* seen in the South Australian Museum.

6. **Acentrogobius herrei** Koumans

Gnatholepis koumansi Herre, Bull. Raffles Mus. 13, 1937, p. 39, pl. 1.
Acentrogobius herrei Koumans, Zool. Meded. Leiden 22, 1940, p. 152 (nom. nov.).

D. 1 VI; D. 2 I. 10; A. I. 9; L.l. ± 30; L.tr. 9-10; Predorsal scales 16.

Body elongate, compressed, height 3.875 in length. Head 3.26 in length. Eye small, 6.33 in head, interorbital 1.33 eyediameter. Snout 3.8 in head, tip before middle of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below front margin of eye. Teeth in 3 or 4 rows, outer row enlarged. In upper jaw on each side a canine in front, in lower jaw on each side a strong canine. Tongue truncate. Gillopenings not continued forward below, isthmus broad. Head scaled above behind the eyes. Cheek with 6 longitudinal rows of scales, between which 4 longitudinal mucous canals, the uppermost of which runs between the second and third row of scales. Opercle scaled. First dorsal fin lower than body, third ray is the longest. Second dorsal fin and anal fin becoming higher posteriorly. Colour in life after Herre: "pale yellow, sprinkled with minute dark specks; above the pectoral is a large black spot covering 6 or 8 scales, each scale bearing a pearl colored spot; over the nape is a narrow black stripe connecting the spots on the two sides; the caudal is dusky, the other fins all black. In alcohol the color has faded to yellowish gray and the pearly lustre has gone from the scales in the shoulder spot." Length 80 mm.

Habitat: Straits of Malacca!.

Type of *Gnatholepis koumansi* seen in Stanford University.

7. **Acentrogobius caninus** (C. V.) (Fig. 16, p. 62)

Gobius caninus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 86.
Gobius grandinosus Eydoux & Souleyet, Zool. Voy. Bonite, Poissons 1841, p. 177, pl. 5 fig. 4.
Gobius caninus Bleeker, Verh. Bat. Gen. 22, 1849, p. 27.
Gobius caninus Günther, Cat. Fishes 3, 1861, p. 38.
Gobius caninus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 175, pl. 109 fig. C.
Gobius caninus Boulenger, Proc. Zool. Soc. London 1890, p. 38.
Coryphopterus bernadoui Jordan & Starks, Proc. U.S. Nat. Mus. 28, 1905, p. 207 fig. 9.

Rhinogobius caninus Jordan & Richardson, Bull. Bur. Fisheries 27, (1907) 1908, p. 277.
Rhinogobius caninus Seale, Philipp. Journ. Sci. § D 5, 1910, p. 285.
Gobius caninus M. Weber, Siboga Exp. Fische 1913, p. 461.
Rhinogobius caninus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 186, pl. 13 fig. 4.
Rhinogobius caninus magnisquamatus Herre, o.c. p. 188.
Gobius caninus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 404.
Rhinogobius similis H. M. Smith, Proc. U.S. Nat. Mus. 79, (1931), 1932, p. 43 (not of Gill).
Rhinogobius simulans H. M. Smith, Copeia 1931 no. 2, p. 64 (substitute name).
Gobius caninus Pellegrin, Mem. Ac. Malgache 14, 1933, p. 141, fig. 80.
Vaimosa umbra Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 84, fig. 26.
Acentrogobius caninus Hardenberg, Treubia 15, 1936, p. 253.
Gobius caninus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 68.
Rhinogobius simulans Koumans, Zool. Meded. Leiden 22, 1940 p. 130 (as synonym).
Coryphopterus bernadoui Koumans, o.c. p. 130 (as synonym).
Rhinogobius umbra Koumans, o.c. p. 135 (as synonym).
Acentrogobius caninus Koumans, Mem. Indian Mus. 13, 1941, p. 228.

D. 1 VI; D. 2 I. 9; A. I. 9; P. 18-19; L.l. ± 30; L.tr. 9; Predorsal scales 17-20.

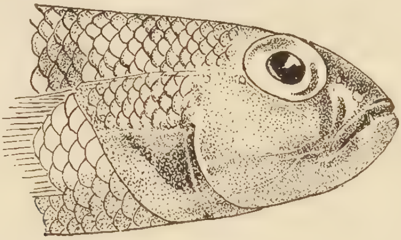

Fig. 16. *Acentrogobius caninus* (C.V.). × 3.

Body elongate, anteriorly a little compressed, posteriorly compressed, height 4-5 in length, 5-6$^1/_2$ in total length. Head obtuse, 3$^3/_4$-4 in length, 4$^3/_4$-5 in total length. Profile convex. Eye 3$^1/_2$-4 in head, interorbital less than $^1/_2$ eyediameter. Snout obtuse, shorter than eye, tip before or a little below inferior margin of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw prominent. Maxillary extends to below anterior part of eye. Teeth in upper jaw of outer row enlarged, in lower jaw on each side 2 canines. Longitudinal mucous canals on cheek. Interorbital medially with an open pore. An open pore behind eye at the beginning of supraopercular groove. Head scaled above behind eye and on upper part of opercle with cycloid scales. Scales of nape, breast and belly cycloid, other scales ctenoid. First dorsal fin lower than body, second and third ray often filiform. Second dorsal and anal fin much lower than body. Pectoral fin without free rays, obtuse, about as long as head. Ventral fin obtuse, longer than head without snout. Caudal fin obtuse, about as long as head. Colour olive above, lighter below. Head with blue or pearl coloured spots. Body with alternating rows of large blackish brown spots. Scapula with large blue spot. Scales laterally with shiny spots. Second dorsal fin with 3 rows of dark spots, bordered with blue. Base of anal fin violet. Caudal fin with blackish spots, base violet. Length 132 mm.

Nom. indig.: Ikan bobossok (Jav. Cheribon), Bossok (Jav. Tjilatjap), Tenguling (Jav. Surabaja), Tunguling (Jav.), Bedul (Mad.).

Habitat: Singapore!; Pulu Weh!; Bintang (Rio): Banka (Blinju); Sumatra (Banjuasin!, Deli); Java (Djakarta!, Tandjong Priok!, Cheribon, Tjilatjap!, Semarang!, Surabaja!, Tandjung Petjinan!, Japara); Madura (Kammal); Bali (Den Pasar!); Sumbawa (Bima!); Timor (Atapupu); Borneo (Balikpapan bay!, Sandakan, Padang Tikar bay!); Celebes (Makassar!). — Madagascar, India!, Ceylon!, Siam (Bandon Bight!), China (Amoy) Hongkong, Macao!, ?Korea, Japan, Riu Kiu Islands, Philippines!, Fiji Islands. — In sea and estuaries.

Types of *Gobius caninus* and type of *Gobius grandinosus* seen in Paris Museum, type of *Coryphopterus bernadoui* and type of *Rhinogobius similis* H. M. Smith (= *simulans*) seen in U.S. Nat. Museum, type and paratypes of *Vaimosa umbra* seen in Ac. Nat. Sci., Philadelphia.

8. **Acentrogobius oligactis** Blkr.

Acentrogobius oligactis Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 132.

D. 1 VI; D. 2 I. 8-9; A. I. 8; P. 15-16; L.l. 30; L.tr. 8-9; Predorsal scales 14.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5 in length, 6 in total length. Head subcylindrical, $3^3/_4$-4 in length, $4^3/_4$-5 in total length. Eye $3^1/_2$-4 in head, very close together. Snouth a little shorter than eye, tip before middle of eye. Anterior nostril tubular. Mouth oblique, jaws subequal. Maxillary extends to below centre of eye. Teeth in several rows. In front of upper jaw some caninoid teeth. In lower jaw the outer row extends to halfway the jaw, last tooth is a curved canine. Some longitudinal and transversal mucous canals on cheek. An open pore in interorbital before and one behind eye in the median line. A small pore behind each eye. Scales ctenoid, becoming cycloid anteriorly; cycloid on head, neck, breast and belly. Head scaled above behind the eye, rest naked. Second and third ray of first dorsal fin filiform. Dorsal fins not continuous. Pectoral fin rounded, a little shorter than head, with some free rays. Ventral fin pointed, shorter than pectoral fin. Caudal fin obtuse, shorter than head. Colour reddish. Preopercle and opercle with small red to purple spots. Outer half of dorsal fins, ventral and anal fin reddish-purple. First dorsal fin with dark spot anteriorly. Pectoral and caudal fin orange to reddish, base of pectoral fin purple. Membrane of caudal fin between the rays with small black spots, placed in 6-8 transverse rows. The colour of the fins in female is much fainter. Length 55 mm.

Habitat: Singapore!; Krakatau (Verlaten Island!); Java (Bay of Djakarta!); Borneo (Balikpapan bay!). — Siam!. — In sea.

Type seen in the Leiden Museum.

9. **Acentrogobius cyanomos** (Blkr.)

Gobius cyanomos Bleeker, Verh. Bat. Gen. 22, 1849, p. 25.
Gobius cyanoclavis Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1167.
Gobius cyanomos Günther, Cat. Fishes 3, 1861, p. 39.
Gobius cyanoclavis Günther, o.c. p. 40.
Gobius cyanosmos Day, Fishes India 1878, p. 287, pl. 61 fig. 5.
Gobius cyanomos Day, Fauna Brit. India Fishes 2, 1889, p. 254.
Ctenogobius dentifer Hora, Mem. Indian Mus. 5, 1923, p. 747, fig. 29.
Acentrogobius spilopterus H. M. Smith, Journ. Siam Soc. Nat. Hist. Suppl. 8 no. 4, 1932, p. 259, pl. 23.
Acentrogobius cyanomos Koumans, Zool. Meded. Leiden 19, 1937, p. 178. — Mem. Indian Mus. 13, 1941, p. 228.

D. 1 VI; D. 2 I. 10; A. I. 8-10; P. 18-19; L.l. ± 30; L.tr. 8-9; Predorsal scales 14.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_2$-5 in length, 6-$6^1/_3$ in total length. Head compressed, obtuse, $3^3/_5$-4 in length, $4^1/_2$-5 in total length. Eye 4-5 in head, interorbital $^1/_3$-$^1/_2$ eyediameter. Snout obtuse, about as long as eye, tip a little below lower margin of eye. Anterior nostril in a short tube. Jaws subequal. Maxillary extends to below posterior part of eye, in young specimens to below anterior margin of pupil. Lips thick. No barbels. Teeth in upper jaw of outer row enlarged, in lower jaw outer row enlarged, extends to halfway the jaw, last two teeth are canines. Longitudinal rows of mucous canals on cheek. Supraopercular groove with open pores, first pore behind the eye. An open pore medially in interorbital space. Head scaled above behind the eye, rest naked. Scales of head, nape, breast and belly cycloid, of body ctenoid. First dorsal fin lower than body, in male first, second and third rays or only second ray filiform. Second dorsal and anal fin lower than body, pointed posteriorly. Pectoral fin without free silklike rays, obtuse, longer than head without snout. Ventral fin rounded, about as long as pectoral fin. Caudal fin obtuse, as long as head. Colour blackish green to olive above, lighter below. Scales with shiny greenish spots. Similar spots on opercle. On shoulder a blue blotch. First dorsal fin yellowish. Ventral fin whitish, pink to violet. Other fins violet, bordered with reddish to orange. Membrane of second dorsal fin and caudal fin with 3-5 rows of whitish spots between the rays. Base of caudal fin above with dark blotch. Length 115 mm.

Nom. indig.: Puntang (Jav.).

Habitat: Singapore; Pulu Weh!; Banka (Korang hadji); Sumatra (Belawan!); Java (Surabaja!, Semarang!); Madura (Kammal). — India!, Penang!, Siam!, ?China. — In sea and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum, types of *Gobius cyanoclavis* seen in British Museum (N.H.), type and cotypes of *Ctenogobius dentifer* seen in Indian Museum, Calcutta, specimen of *Acentrogobius spilopterus* seen in British Museum (N.H.).

With some hisitation I bring to this species a specimen from Tjilatjap, Aug. 14, 1906, of 95 mm, with the indigenous name tenggeleng. It shows D. 1 VI; D. 2 I. 11; A. I. 9; P. 19; L.l. about 32; L.tr. 9; Predorsal scales 14. A few scales are present along upper margin of opercle. A dark stripe runs transversally between the anterior margin of the eye, on each side this stripe is continued through the eye along supraopercular groove to scapula. Body with many shiny spots. First dorsal fin with bluish stripe along the base. Second dorsal and anal fin with minute dark spots.

No dark blotch above at base of caudal fin. A specimen from Dirk de Vries bay, Dec. 1909, van Kampen leg., of 120 mm, and one specimen from Indonesia of 135 mm show the same characters.

10. **Acentrogobius puntang** (Blkr.)

Gobius puntang Bleeker, Nat. Tijdschr. Ned. Indië 2, 1851, p. 486.
Gobius puntangoides Bleeker, o.c. 5, 1853, p. 242.
Gobius puntangoides Günther, Cat. Fishes 3, 1861, p. 19.
Gobius andamanensis Day, Proc. Zool. Soc. London 1870, p. 691.
Gobius puntangoides Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 171, pl. 108 fig. A.
Gobius puntang Day, Fishes India 1878, p. 288, pl. 62 fig. 1.
Gobius canalae Sauvage, Bull. Soc. Philom. Paris (7) 5, 1881, p. 102.
Gobius maculipinnis Macleay, Proc. Linn. Soc. N.S. Wales 8, 1883, p. 267.
Gobius concolor De Vis, o.c. 9, 1884, p. 689.
Gobius puntangoides Day, Fauna Brit. India Fishes 2, 1889, p. 256.
Gnatholepis canalae Jordan & Seale, Bull. Bur. Fisheries 25, (1905), 1906, p. 395.
Gnatholepis maculipinnis Jordan & Seale, o.c. p. 395.
Exyrias puntangoides Jordan & Seale, o.c. p. 405.
Gnatholepis sindonis Snyder, Proc. U.S. Nat. Mus. 35, (1908) 1909, p. 101.
Awaous puntangoides Seale, Occ. Pap. B.P. Bishop Mus. 4, 1906, p. 84.
Exyrias puntang Jordan & Richardson, Checklist 1910, p. 49.
Gobius (Gnatholepis) puntangoides M. Weber, Abh. Senckenb. naturf. Ges. 34, 1911, p. 43.
Gnatholepis sindonis Snyder, Proc. U.S. Nat. Mus. 42, 1912, pl. 68 fig. 1.
Gobius puntang De Beaufort, Bijdragen Dierkunde 1913, p. 139.
Exyrias puntang McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 221.
Exyrias puntang Fowler & Bean, Proc. U.S. Nat. Mus. 62 art. 2, 1922, p. 72.
Gnatholepis puntangoides Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 127, pl. 9 fig. 1.
Gnatholepis puntang Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 407.
Gnatholepis sindonis Schmidt, Trans. Pacific Comm. Acad. Sci. U.S.S.R. 1, 1930, p. 114.
Acentrogobius puntang Koumans, Zool. Meded. Leiden 18, 1935, p. 135.
Gnatholepis puntangoides Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 358.
Gobius puntang Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 171.
Gnatholepis sindonis Koumans, Zool. Meded. Leiden 22, 1940, p. 127 (as synonym).
Gnatholepis maculipinnis Koumans, o.c. p. 160 (as synonym).
Gobius concolor Koumans, o.c. p. 174 (as synonym).
Acentrogobius puntang Koumans, Mem. Indian Mus. 13, 1941, p. 230.

D. 1 VI; D. 2 I. 10; A. I. 9; P. 17; L.l. 30; L.tr. 9-10; Predorsal scales 10.

Body elongate, compressed, height $3^3/_5$-4 in length, 5-6 in total length. Head a little compressed, obtuse, $3^1/_2$-4 in length, 5-$5^3/_4$ in total length. Profile convex. Eye 4-$4^1/_2$ in head, interorbital about $^1/_2$ eyediameter. Snout obtuse, in young specimens much shorter than eye, in adult longer than eye. Tip below inferior margin of eye. Anterior nostril in a short tube. Mouth a little oblique, lips thick. Jaws subequal. Maxillary extends to below anterior part of eye. Teeth in upper jaw of outer row enlarged, in lower jaw canines laterally rudimentary. Two longitudinal mucous canals on cheek. Medially in interorbital an open pore. Open pore behind eye at the beginning of supraopercular groove sometimes present. Head scaled above behind eye; cheek and opercle totally scaled. The scales on cheek are placed in 3 longitudinal stripes, between which the two mucous canals run. Scales behind eye and on lower part of head cycloid, those of upper part of the sides of head ctenoid. Scales of nape, breast and belly cycloid, other scales ctenoid. First dorsal fin lower or higher than body, foremost rays are the longest, sometimes filiform. Second dorsal fin lower than first dorsal fin, in adult posteriorly much higher than in front, posteriorly pointed. Anal fin similar to second dorsal fin. Pectoral fin without free rays, rounded, a little longer than head. Ventral fin rounded, about as long as head. Caudal fin obtusely rounded to pointed, much longer than head. Colour olive above. Laterally 7-8 diffuse transverse stripes. Scales laterally with many shiny spots. Fins reddish. Dorsal fins, pectoral and caudal fin with small black spots. Ventral fin in middle and at the tip mostly blackish. Anal fin with 3-4 longitudinal streaks. Sometimes a dark stripe from eye to end of mouth is present. Length 162 mm.

Habitat: Singapore!; Bintang (Rio); Biliton; Sumatra!; Simalur (Lugu!, Sinabang!, Lasikin!); Nias (Labewa!); Java (Djakarta!); Timor!; Borneo (Sandakan); Sulu Arch. (Jolo, Bungau); Celebes (Tanawanco, Makassar!); Sangir; Ternate; Buru (Kajeli); Ceram (Wahai); Nusa Laut!; Ambon (Batu Merah!); Kei Islands (Warka); Waigeu (Majalibit Inlet!); Aru Islands (Fenoraborih!); New Guinea. — Andamans!, Japan (Naha!), Riu Kiu Islands, Philippines, New Britain!, Ponape, Shortland Island, New Caledonia!, Pelew Islands, Normandy Islands!. — In sea and estuaries.

Specimens of Bleeker's collection seen in Leiden Museum, type of *Gobius canalae* seen in Paris Museum, type of *Gobius maculipinnis* seen in Australian Museum, Sydney, type of *Gobius concolor* seen in Queensland Museum, Brisbane, type of *Gnatholepis sindonis* seen in U.S. Nat. Museum.

Note: One specimen from the Andamans from collection Day has A. I. 8.

11. **Acentrogobius hendersoni** (Herre)

Gnatholepis hendersoni Herre, Bull. Raffles Mus. 12, 1936, p. 7, pl. 3.
Gnatholepis hendersoni Koumans, Zool. Meded. Leiden 22, 1940, p. 151 (revision of the type).

D. 1 VI; D. 2 I. 10; A. I. 9; L.l. 30; L.tr. 8; Predorsal scales 6-7.

Body elongate, compressed, height 4.7 in length. Head 3.6 in length. Eye 3.3 in head, interorbital very narrow. Snout blunt, 2.75 in head, tip below lower margin of eye. Mouth horizontal. Maxillary extends to below pupil of eye. Teeth in several rows; in upper jaw outer row enlarged. In male in lower jaw a very small canine on each side. Gillopenings not continued forward below, isthmus broad. Head scaled above behind the eye, on cheek and opercle weakly ctenoid scales. Scales of body ctenoid. Vertical fins a little lower than height of body. The second and third ray of first dorsal fin are the longest. Pectoral fin rounded. Caudal fin rounded, about as long as head. Colour yellowish, spotted with dusky or brown, except on ventral side. Along the side a row of 5 large blackish blotches, the last one on caudal base, they alternate with white blotches. On lower half of head and body pearl white spots. A dark brown blotch on cheek and one on opercle. Underside of head with alternating brown and white spots. On the base of the membrane between the anterior three rays of first dorsal fin are two deep blue spots. Both dorsal fins, caudal and pectoral fin with rows of brown spots crossing the finrays. Anal fin dusky. Ventral fin dusky with cross bars of white spots. Length 58 mm.

Habitat: Singapore Harbour, on reef!.

Type and paratypes seen in Stanford University.

12. **Acentrogobius cauerensis** (Blkr.)

Gobius cauerensis Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 269.
Gobius ophthalmotaenia Bleeker, o.c. 7, 1854, p. 46.
Gobius capistratus Peters, Monatsber. Ak. Wiss. Berlin 1855, p. 443.

Gobius ophthalmotaenia Günther, Cat. Fishes 3, 1861, p. 37.
Gobius cauerensis Günther, o.c. p. 37.
Gobius capistratus Sauvage, Poissons de Madagascar 1891, p. 356, pl. 38 fig. 5.
Gobius deltoides Seale, Occ. Pap. B.P. Bishop Mus. 1 no. 3, 1901, p. 125.
Gnatholepis knighti Jordan & Evermann, Bull. U.S. Fish Comm. 22, (1902) 1904, p. 204.
Gnatholepis knighti Jordan & Evermann, o.c. 23 part 1, (1903) 1905, p. 487, pl. 58.
Gnatholepis deltoides Jordan & Seale, Bull. Bur. Fisheries 23, (1905) 1906, p. 394, fig. 84.
Gnatholepis davaoensis Seale, Philipp. Journ. Sci. § A 4, 1909, p. 537.
Gobius (Gnatholepis) knighti De Beaufort, Bijdragen Dierkunde 1913, p. 138.
Gobius cauerensis M. Weber, Siboga Exp. Fische 1913, p. 460.
Gobius cauerensis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 107.
Gnatholepis deltoides Herre, o.c. p. 133.
Gnatholepis davaoensis Herre, o.c. p. 134.
Gnatholepis gemmeus Herre, o.c. p. 135, pl. 9 fig. 3.
Gnatholepis knighti Herre, o.c. p. 137, pl. 29 fig. 1.
Gnatholepis capistratus Barnard, Ann. South Afric. Mus. 21, 1927, p. 819.
Acentrogobius cauerensis Koumans, Zool. Meded. Leiden 18, 1935, p. 135.
Gnatholepis corletti Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 418. — o.c. 21, 1936, p. 356, fig. 20.
Gnatholepis deltoides Herre, o.c. 21, 1936, p. 357.
Gnatholepis gemmeus Herre, o.c. 21, 1936, p. 357.
Gobius knighti Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 72, fig. 24.
Gnatholepis knighti Koumans, Zool. Meded. 22, 1940, pp. 133, 156, 184 (as synonym).
Gnatholepis corletti Koumans, o.c. p. 138 (as synonym).
Gobius deltoides Koumans, o.c. p. 156 (as synonym).
Gnatholepis davaoensis Koumans, o.c. pp. 156, 184 (as synonym).
Gnatholepis gemmeus Koumans, o.c. p. 184 (as synonym).
Acentrogobius cauerensis Koumans, Mem. Indian Mus. 13, 1941, p. 231.

D. 1 VI; D. 2 I. 10-11; A. I. 11; P. 14-17; L.l. 30; L.tr. 9; Predorsal scales 8-11.

Body elongate, compressed, height $4\text{-}4^2/_5$ in length, $5^1/_2\text{-}6$ in total length. Head obtuse, compressed, $3^1/_2\text{-}4$ in length, $4^1/_2\text{-}5$ in total length; profile convex. Eye 3-4 in head, interorbital $^1/_3\text{-}^1/_2$ eyediameter. Snout obtuse, as long as eye, or little shorter, tip below inferior margin of eye. Jaws subequal or upper jaw a little prominent. Mouth a little oblique, lips thick. Maxillary extends to below middle of eye or not so far. Teeth in several rows, in upper jaw on each side two canines, in lower jaw on each side a curved canine. Tongue bilobate. Longitudinal mucous canals on cheek. Anteriorly in interorbital on each side an open pore, behind each eye an open pore at the beginning of supraopercular groove. Head scaled above behind the eyes with more or less ctenoid scales. Cheek with large cycloid scales, opercle with smaller weakly ctenoid scales. Scales of breast and belly cycloid, on body ctenoid. First dorsal fin obtuse, lower than body. Second dorsal and anal fin a little higher than first dorsal fin, pointed posteriorly. Pectoral fin without free rays, obtuse, about as long as head. Ventral fin rounded, a little shorter. Caudal fin rounded, about as long as head. Colour greenish above, lighter below. A violet streak from eye to behind maxillary. Snout, cheek and opercle with light spots, nape with dark spots. Opercle with 1-2 purple streaks. Laterally on body dark spots and lines, on ventral part light and dark spots. First dorsal fin anteriorly with dark spots, posteriorly 5-6 rows of oblong orange spots. Second dorsal fin with light spots. Anal fin with purple oblong spots, basal half whitish, outer half violet. Caudal fin orange, lower margin violet, rays spotted. Length 79 mm.

Habitat: Singapore; Sumatra (Kauer); Nias (Telak Dalun!); Cocos (Nova Selma); Java (Bay of Djakarta!, Dirk de Vries bay!, Krawang!); Flores (Endeh!); Samao (Hainsisi reef!); Solor (Lawajong); Borneo (Bontang!); Sulu Arch. (Sanguisiapo!, Sitankai!); Celebes (Menado, Mamudju!); Talaud Islands (Beo!); Salibabu (Lirung!); Sula Besi (Sanana!); Nusa Laut!; Ambon!; Waigeu (Saonek!); New Guinea (Andai!). — East coast of Africa and Red Sea to Japan and the Hawaiian Islands. — In sea and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum, type and paratype of *Gobius deltoides* seen in B.P. Bishop Museum, type of *Gnatholepis knighti* seen in U.S. Nat. Museum, paratypes seen in Stanford University, types of *Gnatholepis gemmeus* seen in Bureau of Science, Manila, type of *Gnatholepis corletti* seen in Field Museum Nat. Hist, Chicago.

13. **Acentrogobius goldmanni** (Blkr.)

Gobius Goldmanni Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 167.

D. 1 VI; D. 2 I. 10; A. I. 9; P. 19; L.l. 30; L.tr. 7; Predorsal scales 8.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5 in length, 6 in total length. Head subcylindrical, obtuse, convex, $3^3/_5$ in length, $4^2/_3$ in total length. Profile convex. Eye 4 in head, interorbital less than $^1/_4$ eyediameter. Snout very obtuse, much shorter than eye, tip before lower margin of eye. Anterior nostril in a very short tube. Jaws subequal or lower jaw a little prominent. Maxillary extends to anterior half of eye. Lips thick. Teeth in upper jaw on each side two caninoid teeth of outer row anteriorly. Two to three longitudinal rows of mucous canals on cheek. No pore in interorbital. Supraopercular groove without pore behind eye. Head scaled above behind eye with cycloid scales. Cheek and opercle naked. Scales of body ctenoid. First dorsal fin lower than body, middle rays are the longest. Second dorsal and anal fin a little lower than body, pointed posteriorly. Pectoral fin without free rays, a little shorter than head. Ventral fin pointed, not shorter than pectoral fin. Caudal fin obtusely rounded, about as long as head. Colour olivous above, lighter below. Back with black spots and small yellow spots. Laterally below many golden transverse bands. Dorsal fins reddish, rays with dark spots. Pectoral, ventral and caudal fin olivous. Anal fin anteriorly dark, posteriorly yellow, bordered with black. Length 63 mm.

Habitat: Timor (Kupang!). — In sea.

Type seen in the Leiden Museum.

14. **Acentrogobius ornatus** (Rüpp.)

Gobius ornatus Rüppell, Atl. Reise N. Afr. Fische 1828, p. 135.
Gobius elegans (Kuhl & v. Hasselt) Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 58.
Gobius ventralis (Ehrenberg) Cuvier & Valenciennes, o.c. p. 113.
Gobius ornatus Rüppell, Neue Wirbelthiere Fische 1838, p. 137.
Gobius interstinctus Richardson, Zool. Erebus & Terror Fishes 1844, p. 3, pl. 5 figs. 3-6.
Gobius periophthalmoides Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, p. 249.
Gobius interstinctus Bleeker, o.c. 3, 1852, p. 275.
Gobius ornatus Günther, Cat. Fishes 3, 1861, p. 21.
Gobius ornatus Kner, Novara Reise Fische 1865, p. 173.
Gobius ornatus Klunzinger, Verh. zool. bot. Ges. Wien 21, 1871, p. 473.
Gobius ornatus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 172, pl. 111 fig. A.
Gobius ornatus Day, Fishes India 1878, p. 294, pl. 63 fig. 1. — Fauna Brit. India Fishes 2, 1889, p. 265.
Gobius venustulus Fowler, Journ. Ac. Nat. Sci. Philadelphia (2) 12, 1904, p. 551, pl. 27.
Gobius ornatus Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 401, fig. 91.
Gobius elegans Jordan & Seale, o.c. p. 402.

Gobius calderae Evermann & Seale, Proc. U.S. Nat. Mus. 31, 1906, p. 511, fig. 3.
Gobius ornatus De Beaufort, Bijdragen Dierkunde 1913, p. 139.
Gobius ornatus M. Weber, Siboga Exp. Fische 1913, p. 460.
Gobius ornatus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 227, pl. 33 fig. 2.
Gobius ornatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 108, pl. 7 fig. 4.
Rhinogobius calderae Herre, o.c. p. 182.
Gobius ornatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 403.
Gobius elegans Fowler o.c. p. 404.
Gobius (Istigobius) stephensoni Whitley, Sci. Rep. Great. Barrier Reef Exp. 4 no. 9, 1932, p. 301.
Acentrogobius ornatus Koumans, Zool. Meded. Leiden 18, 1935, p. 137.
Gobius ornatus Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 353.
Gobius ornatus ornatus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 72.
Gobius calderae Koumans, Zool. Meded. Leiden 22, 1940, p. 128 (as synonym).
Gobius venustulus Koumans, o.c. p. 134 (as synonym).
Acentrogobius ornatus Koumans, Mem. Indian Mus. 13, 1941, p. 231.
Acentrogobius ornatus Koumans in Blegvad & Løppenthin, Danish Sci. Inv. Iran prt 3, 1944, p. 164, fig. 95.

D. 1 VI; D. 2 I. 10-11; A. I. 8-9; P. 19-20; L.l. 28; L.tr. 8-9; Predorsal scales 10-12.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-6 in length, 6-$7^2/_3$ in total length. Head obtuse, subcylindrical, profile convex, $3^2/_3$-4 in length, $4^1/_2$-$5^1/_4$ in total length. Eye 3-4 in head, interorbital about $^1/_3$ eyediameter. Snout very obtuse, about as long as eye, tip below inferior margin of eye. Anterior nostril in a short tube. Jaws subequal. Maxillary extends to below middle of eye or not so far. Lips thick. Teeth in upper jaw: outer row with 3-4 caninoid teeth on each side. In lower jaw in young specimens outer row not enlarged, in adult on each side one weak caninus. Two or three longitudinal mucous canals on cheek. No pore in interorbital, no pore behind eye. Head scaled above behind the eyes with cycloid scales. Cheek and opercle naked. Scales medially on nape and of breast cycloid; laterally on nape and of belly ctenoid. First dorsal fin obtuse, lower than body, second and third rays are the longest. Second dorsal and anal fin lower than body, pointed posteriorly. Pectoral fin obtuse, about as long as head, upper rays free, silklike. Ventral fin rounded, about as long as head. Caudal fin obtuse, of the same length. Colour green to olivous above, lighter below. Laterally on body each scale with a shiny spot. Head laterally with small yellowish spots and three purple transverse streaks: the first over angle of maxillary, the last on border of preopercle. Dorsal half of head and body with irregular rows of violet spots, on ventral half of body larger violet spots in two longitudinal rows. Dorsal fins reddish to yellowish, the membranes with oblong violet spots alternating with yellowish streaks in oblique series. Pectoral fin orange, rays dark spotted, base of the fin with 2-3 dark spots. Ventral fin orange, tip violet. Anal fin yellowish, dark-bordered, on basal half 2-4 purple streaks. Caudal fin orange with dark and yellow spots. Length 100 mm.

Nom. indig.: Tenggeleng batu (Jav.).

Habitat: Singapore; Pulu Brani!; Pulu Weh!; Pulu Berhala!; Biliton; Sumatra (Trussan, Priaman, Padang!, Benkulen!); Nias (Lolowau!); Java (Bay of Djakarta!, Pulu Kellor, Nusa Kembangan!); Madura (Pamekasan!); Bawean; Lombok (Labuan Pandjan!, Pidjot bay!); Sumbawa (Bima!); Flores (Larantuka!, reef Pulu Sabolati!); Solor (Lawajong); Savu (Seba!); Lomblen (Lamalingi bay!); Rotti (Pepela bay!); Timor!; Kambang near Timor!; Borneo (Balikpapan!); Sulu Arch. (Sitankai); Celebes (Menado, Mamudju!); Talaud Islands (Beo!); Salibabu (Lirung!); Sangir; Siau!; Sula Islands!; Sula Besi (Sanana!); Ternate ;Batjan (Labuha); Buru (Kajeli, Leksula reef!); Ceram (Wahai); Nusa Laut!; Ambon (Batu Merah!); Haruku!; Goram; Kei Islands!; Waigeu (Saonek!); Aru Islands!; New Guinea (Sorong!, Skroë!). — Southeast Africa!, Red Sea!, India!, Ceylon, Andamans!, Japan, Philippines, North and West Australia to the South Pacific Islands. — In sea and estuaries.

Types of *Gobius elegans* seen in Paris Museum and Leiden Museum, type of *Gobius interstinctus* seen in British Museum (N.H.), types of *Gobius venustulus* seen in Acad. of Nat. Sci., Philadelphia, type of *Gobius calderae* seen in U.S. Nat. Museum.

15. **Acentrogobius balteata** (Herre)

Vaimosa balteata Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 419. — o.c. 21, 1936, fig. 21. — Proc. Biol. Soc. Washington 57, 1944, p. 8.

Vaimosa balteata Koumans, Zool. Meded. Leiden 22, 1940, pp. 138, 155 (examination of the type).

D. 1 VI; D. 2 I. 7-8; A. I. 6-7; L.l. 28; L.tr. 9; Predorsal scales 10-11.

Body elongate, compressed, height 4 in length. Head $3^1/_4$ in length. Eye about 3 in head, interorbital narrow. Snout shorter than eye, tip before lower part of eye. Lower jaw a little prominent.

Maxillary extends to below middle of eye. Head scaled above behind eye and on opercle. The foremost scale on nape is not enlarged. Gill-openings not continued forward below. Foremost ray of first dorsal fin is the longest. Colour in spirits grayish. A dark stripe from eye to lower part of opercle, crossing interorbital space. From third to sixth dorsal ray a dark transverse band runs obliquely downward and backward to middle of ventral fin. In middle of the side 4-5 large dark spots, a second row alternating with the first along back. First dorsal fin black from second to fifth ray. Length 32 mm.

Habitat; Borneo (Sungei Blakin!); Waigeu (Majalibit Inlet!). — Philippines (Zamboanga).

The specimens from Waigeu were collected in a creek, from Borneo between mangrove vegetation.

Type seen in Field Museum Nat. Hist., cotype seen in Stanford University.

16. **Acentrogobius decoratus** (Herre)

Rhinogobius decoratus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 181, pl. 13 fig. 3.
Ctenogobius decoratus Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 365.
Ctenogobius decoratus Koumans, Zool. Meded. Leiden 22, 1940, p. 154.
Rhinogobius decoratus Koumans, o.c. p. 186.
Ctenogobius decoratus Herre, Bull. Raffles Mus. 16, 1940, p. 51.

D. 1 VI; D. 2 I. 8; A. I. 8; L.l. 26-28; L.tr. 8-9; Predorsal scales ± 8.

Body elongate, compressed posteriorly, subcylindrical anteriorly, height $5\text{-}5^1/_2$ in length. Head $3^2/_3\text{-}3^3/_4$ in length. Eye $3^1/_2\text{-}4$ in head, interorbital very narrow. Snout rounded, equal to eye. Mouth nearly horizontal. Maxillary extends to below middle of eye. Teeth of outer row in upper jaw enlarged. In lower jaw laterally a canine. Scales of body ctenoid, becoming cycloid on breast and pectoral base. Head scaled above behind eye. First dorsal fin lower than body, second and third rays are the longest. Caudal fin rounded, about as long as head. Colour pale whitish yellow with about 6 longtudinal brown lines from head to base of caudal fin. Between these lines there are longitudinal rows of brown spots. The row in middle of the side has about 5 large spots. First dorsal fin with black ocellus between first and second ray. One or two smaller spots on fifth ray. Second dorsal fin with 3 longitudinal rows of dark brown spots. Caudal fin with 6 transverse rows of spots. Anal fin with a basal row of blackish lines. Pectoral fin with two dark bars longitudinally. Length 64 mm.

Habitat: Singapore; ?Borneo (Bontang!); Waigeu!. — Philippines (Leyte!), Fiji (Suva, Ovalau Island).

Type and cotype seen in Bureau of Science, Manila.

17. **Acentrogobius globiceps** (Hora)

Ctenogobius globiceps Hora, Mem. Indian Mus. 5, 1923, p. 744, figs. 24, 25.
Acentrogobius globiceps Koumans, Zool. Meded. Leiden 22, 1940, pp. 137, 180.
?*Ctenogobius kranjiensis* Herre, Bull. Raffles Museum 16, 1940, p. 22, pl. 17.
Acentrogobius globiceps Koumans, Mem. Indian Mus. 13, 1941, p. 234.

D. 1 VI; D. 2 I. 10; A. I. 9; P. ? 17; L.l. 26-27; L.tr. 6; Predorsal scales 7-8.

Body a little compressed, height 4 in length. Head cylindrical, $3^1/_2$-4 in length. Eye 3.3 in head, interorbital $^1/_3$ eyediameter. Snout short, rounded, tip before lower margin of eye. Anterior nostril tubular. Mouth oblique, lower jaw a little prominent. Maxillary extends to below anterior margin of pupil. Teeth in several rows, outer enlarged, distant; in lower jaw outer row extends to halfway the jaw. Tongue emarginate. Mucous canals: two longitudinal canals on cheek, crossed by about 7 transversal ones. Two open pores medially in interorbital, one on each side at the inner margin of posterior nostril. One on each side between the medially posterior pore and the row of 3 pores in supraopercular groove. Three pores along posterior margin of preopercle. First dorsal fin lower than body, second ray is the longest. Second dorsal and anal fin posteriorly higher than body. Caudal fin pointed, $1^1/_2$ times length of head. Scales of body feebly ctenoid. Head scaled above from a little behind the eyes. Opercle scaled at least on its upper half. Colour in spirits yellowish with 4-5 short vertical bands on side of body. Along back some small black spots. Ventral fin blackish in some specimens, other fins dusky. A white submarginal band on second dorsal fin. An oblique white band on upper half of caudal fin. On body some rows of shiny spots. In life back and sides of body yellowish green, belly reddish green. On head and body blackish-brown spots. On body several pearl like blue dots, which are very shiny. Fins with minute dark spots. First dorsal fin with blackish spot behind the fifth ray. Fins grayish. Second dorsal and caudal fin with white stripe. Margin of anal fin darker. Iris gray-black with golden margin. Length 43 mm.

Habitat: ?Singapore Island; Java (Djakarta: Old Harbour Canal!, Fishponds near fishmarket!, Mangrove near Antjol!); Borneo (Balikpapan bay!). — India (Chilka Lake!, Ennur Backwater!).

Type and cotypes seen in Indian Museum, Calcutta.

Note: Koumans, Zool. Meded. Leiden 22, 1940, p. 180, has described some specimens from the surroundings of Batavia, of which he presumes that they are hybrids of *Acentrogobius globiceps* (Hora) and *Stigmatogobius javanicus* (Blkr.).

18. **Acentrogobius leptochillus** Blkr.

Acentrogobius leptochilus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 131.

D. 1 VI; D. 2 I. 7; A. I. 6; P. 18; L.l. 28; L. tr. 7-8; Predorsal scales 7.

Body elongate, compressed, height 4 in length, 5? in total length. Head compressed, $3^1/_3$ in length, 4 in total length. Eye 4 in head, interorbital $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip before inferior margin of eye. Lips not thick. Jaws subequal. Maxillary extends to below posterior margin of eye. Teeth in some rows, outer row enlarged. In upper jaw anteriorly 3 caninoid teeth. Outer row of lower jaw extends to halfway the jaw, last tooth is a curved canine. Two to three longitudinal mucous canals on cheek. Some open pores round the eye. Scales ctenoid, becoming cycloid on nape, breast and belly. Head scaled above behind the eye. On opercle 4-5 large cycloid scales. Pectoral fin rounded, a little shorter than head, without free rays. Ventral fins united, basal membrane well developed. Caudal fin obtuse? Colour of body olive, ventral part lighter. Fins reddish to yellowish. First dorsal fin with two reddish longitudinal stripes, a black spot between fifth and sixth ray. Rays of second dorsal and caudal fin with red points. Length (without caudal fin) 36 mm.

Habitat: Ambon!. — In sea.

Type seen in the Leiden Museum.

Note: Although this species is very alike a *Stigmatogobius*, especially *S. amblyrhynchus*, we bring it to *Acentrogobius* as the foremost scale in the median line behind the eyes is not enlarged and as it has a canine tooth on each side of lower jaw at the end of the outer row of teeth. The specimen *Gobius (Acentrogobius) leptochilus,* recorded by M. Weber in Abh. Senckenb. Naturf. Ges. 34, 1911, p. 41, fig. 10, from Seltutti, Kobroor, Aru Islands, does not belong to this species, but to *Redigobius chrysosoma* (Blkr.).

19. **Acentrogobius reichei** (Blkr.)

Gobius Reichei Bleeker, Nat. Tijdschr. Ned. Indië 5, 1853, p. 509.
Gobius reichei Günther, Cat. Fishes 3, 1861, p. 30.
Gobius Neilli Day, Proc. Zool. Soc. London 1868, p. 152.
Gobius Neilli Day, Fishes India 1878, p. 290, pl. 62 fig. 4. — Fauna Brit. India Fishes 2, 1889, p. 259.
Gobius reichei M. Weber, Zool. Ergebnisse 3, 1894, p. 413.
Gobius caninus M. Weber in Semon, Zool. Forschungsreisen 5, 1895, p. 269 (not of C.V.).
?*Rhinogobius baliuroides* Jordan & Richardson, Bull. Bur. Fisheries 27, (1907) 1908, p. 277.
Gobius (Acentrogobius) neilli Sundara Ray, Rec. Indian Museum 12 pt. 6, 1916, p. 287.
Rhinogobius baliuroides Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 188 (not of Blkr.?).
Rhinogobius melanobranchus Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 82, figs. 24, 25.
Ctenogobius reichei Koumans, Zool. Meded. Leiden 18, 1935, p. 143.
Aboma aliciae Herre, Bull. Raffles Mus. 12, 1936, p. 10, pl. 7 (abnormal specimen).
Ctenogobius baliuroides Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 365. (not of Blkr.?).
Ctenogobius reichei Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 151, fig. 16.
Rhinogobius atribranchiostegus Koumans, Zool. Meded. Leiden 22, 1940, p. 135 (as synonym).
Aboma aliciae Koumans, o.c. p. 152 (as synonym).
Acentrogobius reichei Koumans, Mem. Indian Mus. 13, 1941, p. 232.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 16; L.l. 26-28; L.tr. 7-8; Predorsal scales (12) 2-3.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5 in length, 6 in total length. Head a little depressed, $3^4/_5$ in length, $4^3/_5$ in total length. Profile a little convex. Eye 3 in head, interorbital less than $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip before middle of eye. Anterior nostril in a rim. Mouth oblique, lower jaw prominent. Maxillary extends to below anterior part of eye. Teeth in several rows, outer row enlarged. In lower jaw on each side a canine. Tongue obtuse to scarcely emarginate. Below eye an oblique narrow band of mucous canals running to maxillary. A broad band, bordered by two stronger developed canals runs longitudinally on cheek. A canal along posterior margin of preopercle. Some short canals on opercle. An open pore on each side medially of nostrils, an open pore in median line in front and behind the interorbital space. On each side a pore behind eye, a large one close behind eye at the beginning of supraopercular groove; some along supraopercular groove and posterior margin of preopercle. Head scaled from a little behind the eyes with very thin cycloid scales, which fall out readily. Median part of nape with similar scales, the last ones (2-3), close before first dorsal fin, are more firm and ctenoid. Cheek and opercle naked. Scales of breast and belly cycloid, laterally on body ctenoid. First dorsal fin lower than body, second and third rays are the longest. Second dorsal and anal fin a little lower than first dorsal fin, pointed posteriorly. Pectoral fin obtuse, without free silklike rays, shorter than head. Ventral fin obtuse, a little longer than pectoral fin. Caudal fin obtusely rounded, shorter than head. Colour green above, lighter below. Cheek and opercle with violet streaks. Violet stripe from eye over lips to chin to meet the stripe of the other side. Laterally on back many small olivous spots, in middle of sides 5 larger spots in a longitudinal line. Fins yellowish. First dorsal fin at tip violet. Rays of second dorsal, pectoral and caudal fin spotted. Dark spot on upper part of base of pectoral fin, dark stripe on lower part part of the base. Length 83 mm.

Habitat: Singapore!; Pulu Weh!; Sumatra (Padang!); Java (Bay of Djakarta: Island Hoorn!, Island Haarlem!); Bali (Den Pasar!); Celebes (Tello!, Paré Paré!, Makassar Market!); Ambon!; — Southeast Africa (Inhaca Island!), India!, Andamans!, Siam!, Philippines!, New Hebrides. — In sea and rivers.

Type of *Gobius reichei* seen in the Leiden Museum, type of *Rhinogobius melanobranchus* seen in Acad. Nat. Sci. Philadelphia, type of *Aboma aliciae* seen in Stanford University.

Note: In the description of *Gobius reichei,* Bleeker states that the nape is naked in the median part. The type specimen, Leiden Museum no. 4672, shows no scales in the median part of the nape, so I brought this species to *Ctenogobius* (Notes on Gobioid Fishes 6, Zool. Meded. Leiden 18, 1935, p. 143). *Gobius neilli* Day shows the head scaled above behind eye and the nape totally scaled. These scales are thin and cycloid behind eye and the median part of nape, except two or three close before the insertion of first dorsal fin, which scales are more firm and weakly ctenoid. Other specimens from the Indo-Australian Archipelago show the head and nape naked, except two or three scales close before first dorsal fin, but the chromatophores are arranged as if there should be 12 predorsal scales. The skin in this region shows wrinkles, which correspond with the place of these 12 scales, not being, however, distinct scale-pouches. In all characters, even the colour and the situation of the chromatophores, these specimens are identical with a specimen of *Gobius neilli* from Vizagapatam in India. So I presume that the predorsal scales of the median part of nape and of head fall out readily, except the two or three firmer ones close before the insertion of first dorsal fin. Therefore I bring this species now to *Acentrogobius*, regarding *Gobius neilli* as a synonym. *Rhinogobius melanobranchus* Fowler I regard to be a variety of this species, which has the branchiostegal membrane dark coloured. I found the type of this described species under the name *Rhinogobius atribranchiostegus* in the collection of the Academy of Natural Sciences, Philadelphia. *Aboma aliciae* Herre I regard to be described after an abnormal specimen with 7 rays in first dorsal fin.

13. **Cryptocentrus** (Ehrenberg) Cuvier & Valenciennes

(Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 111).
Paragobius Bleeker, Ned. Tijdschr. Dierkunde 4, 1873, p. 128.
Biat Seale, Philipp. Journ. Sci. 4 no. 6, 1909, p. 552.

Body elongate, compressed, covered with 85 to more than 140 scales, ctenoid on the posterior part of body, cycloid on the anterior part of body or totally cycloid. Head compressed, scaled above

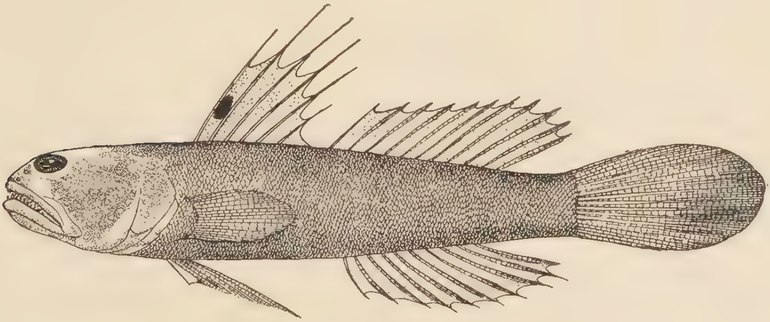

Fig. 17. *Cryptocentrus filifer* (C.V.). × $^2/_3$.

behind the eyes or naked, neck scaled or naked. Bony interorbital about $^{1}/_{4}$ eyediameter. Snout blunt, about as long as eye. Nostrils not tubular or in a short tube. Mouth wide, a little oblique, lower jaw a little prominent. Teeth in both jaws in several rows, the outer enlarged. Outer row of mandible extends to halfway the jaw, last tooth mostly a recurved canine. Tongue truncate. Gillopenings wide, isthmus narrow. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 10-20; A. I. 9-21. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin pointed, longer than head.

Distribution: East coast of Africa to the Pacific.

Key to the Indo-Australian species of Cryptocentrus

1. Second dorsal and anal fin with less than 14 rays.
  A. Nape scaled. All scales of body cycloid, those of caudal region larger than those anteriorly on body.
    a. Head scaled above behind eye.
      a'. More than 100 scales in L.l.
        α. No canine in lower jaw. Eye 6 in head . . . . 1. *C. diproctotaenia* p. 81.
        β. Laterally in lower jaw a canine. Eye 5 in head.
          α'. Height $7^{1}/_{2}$ in total length. D. 2 I. 10. Cheek with oblique blue streaks . . . . 2. *C. cyanotaenia* p. 82.
          β'. Height $8^{2}/_{3}$ in total length. D. 2 I. 11. Head and body with many reddish ocelli . . . . 3. *C. liolepis* p. 82.
      b'. About 90 scales in L.l. Body with 10-11 transversal bands . . . . 4. *C. pavoninoides* p. 83.
    b. Head naked. 130-140 scales in L.l. A canine laterally in lower jaw . . . . . 5. *C. niveatus* p. 84.
  B. Head and nape naked. All scales cycloid.
    a. Height $7^{3}/_{4}$-8 in total length
      a'. 105 scales in L.l.; 25 in L.tr. 1; 16 in L.tr. 2. 7-8 oblique bands on body. . . 6. *C. leptocephalus* p. 85.
      b'. About 120 scales in L.l.; 30 in L.tr. 1; 20 in L.tr. 2. 6 vertical bands on body . . . . 7. *C. filifer* p. 86.
    b. Height $6^{1}/_{2}$ in total length. Body with 4 large transverse bands . . . . 8. *C. papuanus* p. 87.

C. Scales posteriorly on body ctenoid, anteriorly cycloid.
  a. Body with 8-10 oblique yellow bands or 4-5 black spots . . . . 9. *C. russus* p. 88.
2. Second dorsal and anal fin with more than 14 rays.
  A. Second dorsal I. 15; anal fin I. 16. Nape scaled . . . . 10. *C. fontanesii* p. 89.
  B. Second dorsal I. 17-19; anal fin I. 18-20. Nape naked . . . . 11. *C. gymnocephalus* p. 91.

1. **Cryptocentrus diproctotaenia** Blkr.

Cryptocentrus diproctotaenia Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 143.
Cryptocentrus leonis H. M. Smith, Proc. U.S. Nat. Mus. 79 (1932) 1931, p. 46, fig. 21.
Cryptocentrus leonis Koumans, Zool. Meded. Leiden 22, 1940, p. 130 (as synonym).

D. 1 VI; D. 2 I. 10; A I. 10; P. 16-17; L.l. ± 120; L.tr. 1 ± 35; L.tr. 2 ± 20; Predorsal scales ± 30.

Body elongate, compressed, height $5^2/_3$-6 in length, $7^1/_3$-8 in total length. Head obtuse, compressed, $3^2/_5$-$3^1/_2$ in length, $4^1/_2$-$4^3/_5$ in total length. Eye 6 in head, interorbital less than $^1/_2$ eyediameter. Snout obtuse, about as long as eye, tip below inferior margin of eye. Mouth oblique, lower jaw a little prominent. Maxillary extends to behind eye. Lips thick. Teeth in several rows, outer row enlarged, but without canines. Mucous canals on cheek obliquely placed. Interorbital without distinct open pore. Head scaled above from above opercle, nape scaled. Cheek and opercle naked. All scales of head and body cycloid, becoming larger posteriorly. First dorsal obtuse, fourth and fifth rays are the longest, not longer than height of body. Pectoral fin rounded, shorter than head. Ventral fin a little longer than pectoral fin. Caudal fin oblong, a little longer than head. Colour dusky olivous above, lighter below. Cheek and opercle with 6-7 oblique rows of blue to violet spots or streaks. Dorsal fins and caudal fin dusky to purplish with orange rays. Second dorsal fin with about 6 longitudinal rows of short pearly streaks. Ventral fin yellow, in middle and behind dusky. Anal fin yellow or pink with two dusky longitudinal bands. Length 153 mm.

Habitat: Ambon!. — Siam (estuary of Chantabun river!). — In sea and estuaries.

Types of *Cryptocentrus diprototaenia* seen in Leiden Museum, type of *C. leonis* seen in U.S. Nat. Museum.

2. **Cryptocentrus cyanotaenia** (Blkr.)

Gobius cyanotaenia Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 475.
Gobius cyanotaenia Günther, Cat. Fishes 3, 1861, p. 71.
Cryptocentrus cyanotaenia Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 413 (pro parte).

D. 1 VI; D. 2 I. 10; A. I. 10; P. 19; L, L, 110; L.tr. 1 30; L.tr. 2 18; Predorsal scales 25.

Body elongate, compressed, height $5^2/_3$ in length, $7^1/_4$ in total length. Head obtuse, compressed, $3^2/_5$ in length, $4^1/_2$ in total length. Profile convex. Eye 5 in head, interorbital $^1/_3$ eyediameter. Snout truncate to convex, shorter than eye, tip below inferior margin of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw a little prominent. Maxillary extends to behind eye. Lips thick. Teeth in several rows, in upper jaw outer row enlarged, no canines anteriorly. In lower jaw outer row enlarged, to halfway the jaw. Of inner row one tooth enlarged, caninoid. Below eye oblique mucous canals. Two open pores in interorbital, one behind eye. Head scaled above behind eye, nape scaled. Scales cycloid. First dorsal fin obtuse, lower than body, second, third and fourth rays are the longest. Second dorsal and anal fin higher than first dorsal fin, pointed posteriorly. Pectoral fin a little shorter than head. Ventral fin obtuse, not longer than pectoral fin. Caudal fin oblong, a little longer than head. Colour reddish green above, reddish pearl coloured below. Snout with blue spots. Cheek and opercle with short oblique blue streaks. Body with four aequidistant, diffuse transverse bands. On lower part of side 11 blue transverse lines. Dorsal fins and caudal fin with yellow rays. Anal fin with 3 broad longitudinal violet streaks with blue margins. First dorsal and anal fin violet. Upper margin of caudal fin orange. Length 115 mm.

Habitat: Java (Bantam, Djakarta!). — In sea.
Specimen of Bleeker's collection seen in the Leiden Museum.

3. **Cryptocentrus liolepis** Blkr.

Cryptocentrus liolepis Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 145.

D. 1 VI; D. 2 I. 11; A. I. 10; P. 18; L.l. ± 105; L.tr. 1 ± 28; L.tr. 2 ± 16; Predorsal scales ± 20.

Body elongate, compressed, height $6^2/_5$ in length, $8^2/_3$ in total length. Head compressed, obtuse, $4^1/_4$ in length, $5^3/_4$ in total length.

Profile convex. Eye 5 in head, interorbital narrow. Snout shorter than eye, tip before lower part of eye. Mouth oblique, lower jaw a little prominent. Maxillary extends to below middle of eye. Lips thick. Teeth in several rows, outer row enlarged. In lower jaw on each side a canine. Two longitudinal mucous canals on cheek and 3-4 oblique ones. In median line in interorbital two open pores. Head scaled from above opercle, nape scaled. Cheek and opercle naked. All scales of head and body cycloid, becoming larger posteriorly. First dorsal fin lower than body. Second dorsal and anal fin lower than body. Pectoral and ventral fin a little shorter than head. Caudal fin lanceolate, much longer than head. Colour of body and fins dusky violet. Head and trunk with orange to red ocelli. Length 85 mm.

Habitat: Borneo!.

Type seen in the Leiden Museum.

4. **Cryptocentrus pavoninoides** (Blkr.)

Gobius pavoninoides Bleeker, Verh. Bat. Gen. 22, 1849, p. 33.
Cryptocentrus venustus Seale, Philipp. Journ. Sci. § D 9, 1914, p. 76, pl. 2 fig. 2.
Cryptocentrus cebuanus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 240, pl. 19 fig. 2.
Cryptocentrus venustus Herre, o.c. p. 244.
Cryptocentrus cebuanus Koumans, Zool. Meded. Leiden 22, 1940, p. 189 (as synonym).
Cryptocentrus venustus Koumans, o.c. p. 190 (as synonym).
Cryptocentrus pavoninoides Koumans, Mem. Indian Mus. 13, 1941, p. 240.

D. 1 VI; D. 2 I. 11; A. I. 10; P. 18; L.l. 90; L.tr. 1 24; L.tr. 2 14; Predorsal scales 20.

Body elongate, compressed, height 5 in length, $6^3/_4$ in total length. Head obtuse, convex, 4 in length, 5 in total length. Profile convex. Eye 4 in head, interorbital $^1/_3$ eyediameter. Snout truncate, much shorter than eye, tip before inferior margin of eye. Anterior nostril in a short tube. Mouth very oblique, lower jaw a little prominent. Maxillary extends to below posterior margin of eye. Lips thick. Teeth in many rows, in upper jaw outer row enlarged, in front caninoid. In lower jaw outer row extends to halfway the jaw, not caninoid, inner row enlarged. Longitudinal mucous canals on cheek. No pore in interorbital. Behind eye an open pore at the beginning of supraopercular groove. Head scaled above behind eye. Scales of head, nape and body cycloid. First dorsal fin lower than body, middle rays are the longest. Second dorsal and anal fin not higher than first dorsal fin, pointed posteriorly. Pectoral fin obtuse, a little shorter than head. Ventral fin obtuse, a little longer than head. Caudal fin oblong, not much longer than head. Colour dark olivous above, reddish green below. Head and nape with small pearl like spots, bordered with violet or blue. Laterally on body 10-11 blackish transversal bands, narrower than the interspaces. Fins red to yellowish red. Only ventral fin purplish, middle and tip black. First dorsal fin halfway between each ray with oblong black spots. Second dorsal fin with hyaline spots. Length 140 mm.

Habitat: Singapore; Madura (Sumanep!). — India!, Hongkong!, Philippines!. — In sea.

Type of *Gobius pavoninoides* seen in the Leiden Museum, type of *Cryptocentrus cebuanus* and type of *C. venustus* seen in Bureau of Science, Manila.

Note: *Cryptocentrus venustus* agrees fully with *C. pavoninoides,* except the colourdescription by Seale, which differs from the description by Bleeker.

5. **Cryptocentrus niveatus** (C.V.)

Gobius niveatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 107.
Gobius niveatus Günther, Cat. Fishes 3, 1861, p. 71.

D. 1 VI; D. 2 I. 11; A. I. 10; P. 18; L.l. 130-140; L.tr. 1 28-30; L.tr. 2 18; Predorsal scales 20.

Body elongate, compressed, height 8 in length, $10^1/_2$ in total length. Head obtuse, convex, 5 in length, $6^2/_3$ in total length. Profile convex. Eye $4^1/_2$ in head, interorbital less than $^1/_2$ eyediameter. Snout obtuse, shorter than eye, tip before lower margin of eye. Anterior nostril in a short tube. Mouth very oblique, lower jaw a little prominent. Maxillary extends to below middle of eye. Lips thick. Teeth in many rows. In upper jaw outer row enlarged, in front caninoid. In lower jaw outer row extends to halfway the jaw, enlarged, last tooth is a curved canine; inner row enlarged, curved. Longitudinal mucous canals on cheek. Anteriorly in interorbital medially a small open pore. No pore behind eye. Head naked, nape scaled. Scales cycloid. First dorsal fin lower than body, middle rays are the longest. Second dorsal and anal fin anteriorly lower than body, pointed posteriorly. Pectoral and ventral fin obtuse, about as long as head. Pectoral fin without free rays. Caudal fin lanceolate, about two times length of head. Colour reddish green. According to Cuvier & Valenciennes cheek, opercle and belly with white spots, all fins with dark spots. Length 110 mm.

Habitat: Java!.

Type seen in the Paris Museum.

6. **Cryptocentrus leptocephalus** Blkr.

Cryptocentrus leptocephalus Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 146.
Gobius (Cryptocentrus) (*niveatus* C.V.?) M. Weber, Siboga Exp. Fische 1913, p. 474.
Cryptocentrus rubropunctatus Sewell, Rec. Indian Mus. 10, 1914, p. 134, pl. 8 fig. 3.
Cryptocentrus geniornatus Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 428. — o.c. 21, 1936, fig. 30.
Cryptocentrus geniornatus Koumeans, Zool. Meded. Leiden 22, 1940, p. 140 (as synonym).
Cryptocentrus leptocephalus Koumans, Mem. Indian Mus. 13, 1941, p. 240.
Cryptocentrus leptocephalus H. M. Smith, Bull. 118 U.S. Nat. Mus., 1945, p. 554, fig. 107.

D. 1 VI; D. 2 I. 10-11; A. I. 10; P. 17; L.l. ± 105; L.tr. 1 25; L.tr. 2 16.

Body elongate, compressed, height 6 in length, 8 in total length. Head obtuse, convex, 4 in length, $5^1/_5$ in total length. Profile convex. Eye 4 in head, interorbital $^1/_4$ eyediameter. Snout shorter than eye, tip below lower margin of eye. Mouth oblique, lower jaw a little prominent. Maxillary extends to below posterior part of eye. Teeth in several rows; in upper jaw outer row enlarged, in front 2-3 canini; in lower jaw outer row enlarged, on each side a canine, inner row nearly not enlarged. Tongue rounded. On cheek longitudinal mucous canals. Head naked, nape naked. Scales of body all cycloid. First dorsal fin higher than body, pointed, third and fourth rays are the longest. Second dorsal and anal fin pointed posteriorly. Caudal fin oblong, a little longer than head. Colour reddish green above, reddish pearl like below. On head many reddish spots. On body 7-8 oblique transverse bands. Fins weakly red to yellow. First dorsal fin with many red spots, bordered with violet, placed in longitudinal rows. Second dorsal fin with dark border. Middle and tip of ventral fin and outer half of anal fin violet. Length 100 mm.

Habitat: Singapore!; Nias (Gunung Sitoli!); Java (Bay of Djakarta: Island Hoorn!, Island Onrust!, Island Leiden!); Nusa Laut!; Waigeu!. — Persian Gulf!, India!, Birma!, Siam!.

Type of *Cryptocentrus leptocephalus* seen in the Leiden Museum, type of *C. rubropunctatus* seen in Indian Museum, Calcutta, type of *C. geniornatus* seen in Field Museum Nat. Hist.

7. **Cryptocentrus filifer** (C.V.) (Fig. 17, p. 79)

Gobius filifer Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 106.
Gobius Knutteli Bleeker, Act. Soc. Sci. Indo-Neerl. 3, 1858, p. 16, pl. 1 fig. 2.
Gobius knutteli Günther, Cat. Fishes 3, 1861, p. 73.
Paragobius Knutteli Bleeker, Ned. Tijdschr. Dierkunde 4, 1873, p. 128.
Cryptocentrus Knutteli Bleeker, Verh. Ak. Amsterdam 18, 1879, p. 19.
Cryptocentrus filifer Jordan & Snyder, Proc. U.S. Nat. Mus. 24, (1902) 1901, p. 72, fig. 12.
Cryptocentrus filifer Jordan, Tanaka & Snyder, Journ. Coll. Sci. Univ. Tokyo 33 art. 1, 1913, p. 349, fig. 301.
Cryptocentrus filifer Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 241.
Cryptocentrus filifer Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 82.

D. 1 VI; D. 2 I. 10; A. I. 9; P. 17-18; L.l. 100-120; L.tr. 1 30; L.tr. 2 20.

Body elongate, compressed, height $5^4/_5$ in length, $7^3/_4$ in total length. Head obtuse, compressed, $3^3/_5$ in length, $4^4/_5$ to more than 5 in total length. Profile convex. Eye 4 in head, interorbital less than $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip below inferior margin of eye. Nostril not tubular. Mouth oblique, lower jaw prominent. Maxillary extends to a little behind eye. Teeth in many rows, in upper jaw outer row enlarged, in front caninoid. In lower jaw outer row to halfway the jaw, enlarged, last tooth is a curved canine, inner row not enlarged. Longitudinal rows of mucous canals on cheek. No pore in interorbital. No pore behind eye. Head and nape naked. Scales of body cycloid. First dorsal fin pointed, much higher than body. Second dorsal fin a little lower than body, pointed posteriorly, less than two times longer than first dorsal fin. Anal fin similar to second dorsal fin, but shorter. Pectoral fin rounded, a little longer than head. Ventral fin pointed, about as long as head. Caudal fin oblong, not much longer than head. Colour reddish green above, pearl like below. Cheek and opercle with small pearl like spots, bordered with blue or violet. Body with 6 diffuse dark transverse bands, the first on opercle, fourth and fifth from second dorsal fin to anal fin, sixth on caudal fin. Dorsal fins and pectoral fin orange. First dorsal with a pearl like transverse streak on the membrane between the foremost 5 rays, between first and second ray at the base an oblong black blotch. Second dorsal fin with 3-4 undulated pearl like bands. Pectoral fin with dark spot on base. Ventral fin whitish, near tip violet. Basal half of anal fin white, outer half violet. Rays of caudal fin orange, membrane violet; halfway base a yellow transverse band. Length 132 mm.

Habitat: Singapore; Java (Djakarta!); Ambon. — China!, Hongkong!, Macao, Japan!. — In sea.

Type of *Gobius knutteli* seen in the Leiden Museum, the type of *Gobius filifer* in Paris Museum shows L.l. about 100, anterior part of body naked.

8. **Cryptocentrus papuanus** (Peters)

Gobius papuanus Peters, Monatsber. Ak. Wiss. Berlin 1876, p. 839.
Cryptocentrus papuensis Bleeker, Arch. neerl. sc. ex. et nat. 13, 1878, p. 54.
Amblygobius papuanus Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 406.
Amblygobius papuanus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 413.
Cryptocentrus cheni Herre, Lingnan Sci. Journ. 12 no. 3, 1933, p. 429.
Cryptocentrus cheni Koumans, Zool. Meded. Leiden 22, 1940, p. 147 (as synonym).

D. 1 VI; D. 2 I. 10; A. I. 10; L.l. ± 95; L.tr. 1 ± 35; L.tr. 2 ± 16.

Body elongate, compressed, height 4.8 in length, $6^1/_2$ in total length. Head 3.4 in length, 4 in total length. Eye 4-$4^1/_2$ in head, interorbital very narrow. Snout $3^1/_2$ in head. Mouth a little oblique, jaws equal. Maxillary extends to below middle of eye. Teeth in several rows. In front in upper jaw 2 pairs of canines. In lower jaw laterally a pair of canines. Head and nape naked. Scales of body cycloid, larger posteriorly. Third, fourth and fifth rays of first dorsal fin are the longest, a little longer than height of body. Ventral fin pointed. Caudal fin about as long as head. Colour yellowish with 6 broad vertical dark bands, the foremost two bands below first dorsal fin, the next three below second dorsal fin, the last on caudal peduncle. Nape, opercle and preopercle with brown spots. First dorsal fin colourless, with 2 rows of large elliptical dark-margined clear spots on the membrane of upper half of fin, and a similar longitudinal stripe below the spots. Second dorsal fin brown, each membrane with a large elliptical dark-margined clear spot. Anal fin blackish with clear band. Ventral fin dusky. Length 72 mm.

Habitat: New Guinea (Mac Cluers bay). — China (Hainan!).

Type of *Cryptocentrus cheni* seen in Stanford University.

9. **Cryptocentrus russus** (Cant.)

Gobius chrysargus v. Hasselt in Leiden Museum.
Gobius russus Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1168.
Gobius polyophthalmus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 474.
Gobius Voigtii Bleeker, o.c. 7, 1854, p. 83.
Gobius xanthotaenia Bleeker, o.c. 9, 1855, p. 308.
Gobius russus Günther, Cat. Fishes 3, 1861, p. 72.
Gobius voigtii Günther, o.c. p. 72.
Gobius polyophthalmus Günther, o.c. p. 73.
Gobius (Cryptocentrus) papuanus M. Weber, Siboga Exp. Fische 1913, p. 474 (not of Peters).
Gobius (*Cryptocentrus*) (*cyanotaenia* Blkr.?) M. Weber, o.c. p. 475.
Cryptocentrus cingulatus Herre, Lingnan Sci. Journ. 13 no 2, 1934, p. 291.
?*Cryptocentrus voighti* Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 382.
Cryptocentrus russus Koumans, Zool. Meded. Leiden 20, 1937, p. 15.
Cryptocentrus cingulatus Koumans, o.c. 22, 1940, p. 148 (as synonym).

D. 1 VI; D. 2 I. 10; A. I. 10; P. 17-18; L.l. 85; L.tr. 24; Predorsal scales ± 25.

Body elongate, compressed, height 5-6 in length, $6^1/_2$-$7^3/_4$ in total length. Head obtuse, compressed, $3^1/_2$-4 in length, $4^1/_2$-$5^1/_4$ in total length. Eye $3^3/_4$-4 in head, interorbital less than $^1/_3$ eye-diameter. Snout obtuse, a little shorter than eye, tip before inferior margin of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below posterior half of eye. Teeth in several rows. In upper jaw outer row enlarged, in front on each side about 4 caninoid teeth. In lower jaw outer row enlarged, in front on each side about 5 caninoid teeth, the outer row extends to halfway the jaw, last tooth is a curved canine; laterally in lower jaw inner row a little enlarged. Three longitudinal mucous canals on cheek. No pore in interorbital space, no pore behind eye. Head and nape naked or rudimentary scaled. Scales of body cycloid anteriorly, ctenoid posteriorly. First dorsal fin lower than body, first rays are the longest, sometimes filiform. Second dorsal and anal fin pointed posteriorly. Pectoral and ventral fin a little shorter than head. Caudal fin lanceolate, a little longer than head. Colour reddish green above, lighter red below. Nape and opercle with many purple ocelli. On body on each side 4-8 dark blotches. Body with 8-10 yellow bands, running obliquely forwards. Vertical fins light blue. First dorsal fin with small purple spots, bordered with blue or two waved transverse dark bands, separated by a white one, which surrounds a large black spot between third and fifth ray; upper margin yellowish. Second dorsal fin with 5-6 longitudinal rows of purple spots, bordered with blue. Outer margins of second dorsal and caudal fin bordered with yellow, blue and purple. Caudal fin with oblique purple streaks. Pectoral fin orange. Ventral fin violet. Anal fin in middle between each ray a violet spot, outer margin violet and yellow.

Variety *voigtii:* body with 8 broad dark transverse bands. First dorsal fin posteriorly with blue spot; a black spot superiorly between fourth and fifth ray.

Variety *xanthotaenia:* laterally 4 large spots in a longitudinal line. First dorsal fin superiorly between third and fifth ray with a black spot. Base of anal fin with orange spots in a longitudinal row.

Length 126 mm.

Nom. indig.: Blodok (Mal.).

Habitat: Singapore; Sumatra! (Ulakan, Siboga); Nias (Gunung Sitoli!); Java! (Djakarta, Island Hoorn!, Pulu Ajer, Tjiringin); Bawean; Celebes (Makassar); Saleyer!; 1° 42′.5 S, 130° 47′.5 E near New Guinea!. — Southeast Africa (Inhaca!), Penang!, China (Heungchow!), Philippines, ?Fiji Islands, Australia (Cape York!, Port Essington).

Types of *Gobius polyophthalmus, voigtii* and *xanthotaenia* seen in the Leiden Museum, types of *Gobius russus* seen in British Museum (N.H.).

10. **Cryptocentrus fontanesii** (Blkr.)

Gobius Fontanesii Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 764.
Gobius fontanesii Günther, Cat. Fishes 3, 1861, p. 74.
Biat luzonica Seale, Philipp. Journ. Sci. § A. 4, 1909, p. 532.
Gobius (Cryptocentrus) Fontanesii M. Weber, Siboga Exp. Fische 1913, p. 474.
Oxyurichthus fontanesii Fowler & Bean, Proc. U.S. Nat. Mus. 62 art. 2, 1922, p. 72.

Cryptocentrus fontanesii Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 242.
Biat luzonicus Herre, o.c. p. 246, pl. 20 fig. 1.
Biat luzonicus Roxas, Copeia 1935 no. 1, p. 19.
?*Cryptocentrus fontanesi* Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 83, fig. 33.
Biat luzonica Koumans, Zool. Meded. Leiden 22, 1940, pp. 154, 190 (as synonym).

D. 1 VI; D. 2 I. 15; A. I. 16-17; P. 20-21; L.l. 110; L.tr. 1 25; L.tr. 2 12.

Body elongate, compressed, height 6 in length, $7^1/_2$ in total length. Head obtuse, compressed, $4^2/_3$ in length, $5^1/_2$-6 in total length. Profile convex. Eye 4 in head, interorbital less than $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip before or a little below inferior margin of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw prominent. Maxillary extends to below middle of eye. Teeth in many rows. In upper jaw outer row enlarged, in front caninoid. In lower jaw outer row to halfway the jaw, no canine; in inner row some canines. Two to three longitudinal mucous canals on cheek. Anteriorly in interorbital an open pore on each side. Behind eye an open pore at the beginning of supraopercular groove. Head scaled above behind eye with very small scales, upper part of opercle scaled, middle of cheek with a patch of small scales. Scales of head, nape, breast and belly cycloid, other scales ctenoid. First dorsal fin lower than body, middle rays are the longest. Second dorsal fin less than two times longer than the first, about as high as body, pointed posteriorly. Anal fin similar to second dorsal fin. Pectoral fin obtuse, a little shorter than head. Ventral fin pointed, a little longer than head. Caudal fin lanceolate, much longer than head. Colour greenish red above, pearl like below. Laterally 3 broad dark bands, the first below first dorsal fin, second below middle of second dorsal fin, third below posterior rays of second dorsal fin. Head above with small pearl like spots. Fins reddish yellow. First dorsal and ventral fin in middle dark. Second dorsal, caudal and anal fin darker near margin. Second dorsal fin at the base between the rays with yellow spots. Length 197 mm.

Nom. indig.: Olol (Jav.).

Habitat: Singapore; Sumatra (West coast of Atjeh!); Java (Djakarta!, near Panarukan!); Celebes (Bulukomba); Ambon; Obi major (Laiwui!). — ?Japan, Philippines (Cebu!, Luzon!, Mindoro!). — In sea.

Type of *Gobius fontanesii* seen in the Leiden Museum, type of *Biat luzonica* seen in Bureau of Science, Manila.

11. **Cryptocentrus gymnocephalus** (Blkr.)

Gobius gymnocephalus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 473.
Gobius gymnocephalus Günther, Cat. Fishes 3, 1861, p. 75.
Gobius gymnocephalus Day, Fishes India Suppl. 1888, p. 792. — Fauna Brit. India Fishes 2, 1889, p. 249.
Cryptocentrus gymnocephalus Koumans, Mem. Indian Mus. 13, 1941, p. 241.

D. 1 VI; D. 2 I. 17-19; A. I. 18-20; P. 19-20; L.l. 120-130; L.tr. 1 35; L.tr. 2 18.

Body elongate, compressed, height $6^1/_3$-7 in length, 8-$9^1/_4$ in total length. Head obtuse, compressed, $4^2/_5$-$4^3/_4$ in length, about 6 in total length. Profile convex. Eye 4-$4^2/_5$ in head, interorbital less than $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip before or a little below lower margin of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw a little prominent. Maxillary extends to below posterior part of eye. Teeth in many rows. In upper jaw outer row enlarged, caninoid in front. In lower jaw outer row enlarged, to halfway the jaw, no canines; inner row with 2-4 canines. Posteriorly in median line in interorbital an open pore. Behind eye at the beginning of supraopercular groove an open pore. Head naked, middle of nape naked. Scales anteriorly on body cycloid, posteriorly ctenoid. First dorsal fin as high as or a little lower than body, fourth and fifth rays are the longest. Second dorsal and anal fin two times longer than first dorsal fin, lower than body, pointed posteriorly. Pectoral fin a little shorter than head. Ventral fin obtuse, a little longer than head. Caudal fin lanceolate, about two times the length of head. Colour reddish green above, reddish pearl like below. Laterally 3 transverse bands, the first below first dorsal fin, second below anterior part of second dorsal fin, third below posterior part of second dorsal fin. Dorsal fins, anal and caudal fin reddish green. First dorsal fin with red margin. Second dorsal fin bordered with yellow, blue and red. Anal fin halfway with a red and blue longitudinal band. Caudal fin witht many red and and blue alternating oblique stripes, upper margin yellow. Pectoral fin reddish. Ventral fin reddish violet. Length 140 mm.

Nom. indig.: Blodok (Mal.).

Habitat: Pulu Weh!; Java (Djakarta). — Madras, Mergui Archipelago!, Siam (Koh Sichang!), Hongkong. — In sea.

Types of *Gobius gymnocephalus* seen in the Leiden Museum.

14. **Oligolepis** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 318.)

Aparrius Jordan & Richardson, Bull. Bur. Fisheries 27, (1907) 1908, p. 278.

Body elongate, compressed, covered with 25-30 ctenoid scales, becoming cycloid below the first dorsal fin. Head compressed, a little obtuse, naked. Bony interorbital about $^1/_2$ eyediameter. Snout about as long as eye, blunt. Mouth oblique, jaws subequal or lower jaw a little prominent. Teeth in both jaws in several rows, in upper jaw outer, in lower jaw inner row enlarged; outer row of lower jaw extends to halfway the jaw. Some teeth behind symphysis, and last teeth of outer row of lower jaw a little stronger and caniniform. Tongue truncate, not emarginate. Gillopenings not very wide, isthmus broad. Inner edge of shouldergirdle without distinct fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 9-12; A. I. 9-12. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin lanceolate, longer than head.

Distribution: East coast of Africa, India, Ceylon, Riu Kiu Islands. Philippines to New Hebrides.

1. **Oligolepis acutipennis** (C.V.) (Fig. 18, p. 93)

Gobius acutipennis Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 80.
Gobius setosus Cuvier & Valenciennes, o.c. p. 81.
Gobius pasuruensis Bleeker, Verh. Bat. Gen. 22, 1849, p. 32.
Gobius melanostigma Bleeker, o.c. p. 32.
Gobius spilurus Bleeker, o.c. p. 32.
Gobius Temminckii Bleeker, o.c. p. 33.
Gobius acutipennis Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1166.
Gobius oligolepis Bleeker, Nat. Tijdschr. Ned. Indië 5, 1853, p. 508.
Gobius oligolepis Günther, Cat. Fishes 3, 1861, p. 14.
Gobius pasuruensis Günther, o.c. p. 32.
Gobius acutipinnis Günther, o.c. p. 44.
Gobius temminckii Günther, o.c. p. 47.
Stenogobius (Oligolepis) melanostigma Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 318.
Gobius acutipinnis Day, Fishes India, 1878, p. 291, pl. 61 fig. 1. — Fauna Brit. India Fishes 2, 1889, p. 261.

Acentrogobius acutipinnis Smith & Seale, Proc. Biol. Soc. Washington 19, 1906, p. 81.
Rhinogobius ocyurus Jordan & Seale, Bull. Bur. Fisheries 26, (1906) 1907, p. 42, fig. 14.
Aparrius acutipinnis Jordan & Richardson, o.c. 27, (1907) 1908, p. 278.
Gobius (Acentrogobius) acutipinnis Sundara Ray, Rec. Indian Mus. 12 pt. 6, 1916, p. 287.
Ctenogobius acutipinnis Hora, Mem. Indian Mus. 5, 1923, p. 743.
Gobius acutipennis Barnard, Ann. South Afri. Mus. 21, 1927, p. 823.
Gobius oligolepis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 110.
Aparrius acutipinnis Herre, o.c. p. 204, pl. 16 fig. 2.
Oligolepis acutipinnis Koumans, Zool. Meded. Leiden 18, 1935, p. 141.
Stenogobius acutipinnis Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 76.
Oligolepis acutipennis Koumans, Mem. Indian Mus. 13. 1941, p. 237.
Oligolepis acutipennis Koumans in Blegvad & Løppenthin, Danish Sci. Inv. Iran prt 3, 1944, p. 166, fig. 96.

D. 1 VI; D. 2 I. 10-11; A. I. 10-11; P. 20-21; L.l. 27-30; L.tr. 7-8.

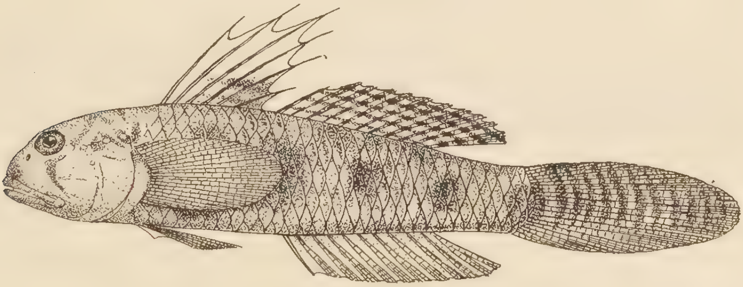

Fig. 18. *Oligolepis acutipennis* (C.V.). n.s.

Body elongate, compressed, height $4^1/_4$-$4^1/_2$ in length, $5^1/_2$-7 in total length. Head obtuse, a little compressed, 4 in length, 5-6 in total length. Profile convex. Eye 3-4 in head, interorbital $^1/_3$ eyediameter. Snout obtuse, about as long as eye, tip below lower margin of eye. Anterior nostril in a short tube. Jaws subequal. Maxillary extends to below posterior part of eye or not so far. Teeth anteriorly in several rows. In upper jaw outer row enlarged in front. In lower jaw inner row enlarged. In interorbital anteriorly on each side an open pore, posteriorly an open pore in median line. An open pore behind eye at the beginning of supraopercular groove. From posterior nostril a mucous canal, divided into two branches, running longitudinally on cheek. Head and nape naked, a few scales close before insertion of first dorsal fin. Scales on belly cycloid, other scales ctenoid. First dorsal fin about as high as body, middle rays are the longest, sometimes prolonged. Second dorsal and anal fin about as high as first dorsal fin, pointed posteriorly. Pectoral fin obtuse, a little longer than head. Ventral fin obtuse, not longer than head. Caudal fin lanceolate, longer than head. Colour yellowish. From eye to behind maxillary an oblique violet streak. Five large dark spots, alternating with short dark transversal stripes, in a longitudinal row along the side. Back with transverse bars. Head and back with minute black spots. Fins reddish. Membrane of dorsal fins and caudal fin with rows of dark spots. Dark spot on base of pectoral fin. Ventral fin reddish, in middle violet. Length 115 mm.

Nom. indig.: Puntang (Jav.).

Habitat: Singapore; Sumatra (Priaman, Labuan Batu!, Sungei Serdang!); Nias (Gunung Sitoli!); Java (Djakarta!, Tandjong Priok!, Pasuruan, Surabaja!, Tji Bening west of Dirk de Vries bay!); Madura (Kammal); Bali (Padang bay!). — Coast of Natal, India!, Ceylon!, Penang, Riu Kiu Islands, Philippines, New Hebrides. — In sea and estuaries.

Types of *Gobius acutipennis* and types of *Gobius setosus* seen in Paris Museum, type of *Gobius melanostigma* seen in the Leiden Museum.

Note: The specimen from Natal coast, mentioned by Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 498, as *Aparrius acutipinnis* (Val.), does not belong to this species, see Koumans, Zool. Meded. Leiden 22, 1940, p. 136.

15. **Cristatogobius** Herre

(Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 170.)

Body elongate, compressed, covered with 28-30 ctenoid scales; scales on nape smaller, cycloid, extending to above opercle. Neck with a longitudinal dermal crest. Head further naked. Eyes very close together. Snout less than 1 eyediameter. Mouth nearly vertical, lower jaw prominent. Teeth in four rows in each jaw, those of outer and inner row enlarged; lower jaw with a posterior lateral pair of curved canines of outer row. Three longitudinal mucous canals on cheek. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 10; A. I. 10. Caudal fin pointed, a little longer than head.

Distribution: Philippines, Sulu Islands.

1. **Cristatogobius lophius** Herre (Fig. 19, p. 95)

Cristatogobius lophius Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 170, pl. 13 fig. 1.

Cristagobius lophius Koumans, Zool. Meded. Leiden 22, 1940, p. 186.

Cristatogobius lophius Herre, Philipp. Journ. Sci. 72 no. 4, 1940, p. 365.

D. 1 VI; D. 2 I. 10; A. I. 10; L.l. 28-30; L.tr. 10; Predorsal scales 7-10.

Body oblong, compressed, height $4^1/_2$ in length. Head $3^1/_2$-$3^2/_3$ in length. Eye $3^1/_2$ in head, interorbital very narrow. Snout convex, 4.6-5 in head. Mouth oblique, lower jaw prominent. Maxillary extends to below anterior part of eye. Teeth in four rows, outer and inner row enlarged. In lower jaw on each side a large canine in outer row. Three longitudinal mucous canals on cheek. In interorbital anteriorly and posteriorly an open pore. Four open pores in supraopercular groove and two along posterior margin of preopercle. From between the eyes a median dermal crest on nape. Body scaled with ctenoid scales, extending on nape to above opercle. Head further naked. First dorsal fin lower than body, second and third rays are the longest. Second dorsal fin and anal fin higher than first dorsal fin, but lower than body. Pectoral fin and ventral fin pointed. Caudal fin pointed, a little longer than head. Colour dark brown with 5 or 6 paler transverse bands. On base of pectoral fin two large black spots. On head and anterior half of body black dots. Nuchal crest chocolate brown. First dorsal fin dark brown with a blackish spot behind fifth ray. Other fins brown to blackish. Length 34 mm.

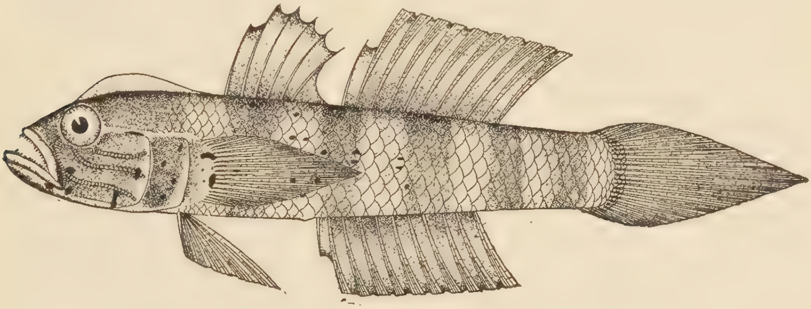

Fig. 19. *Cristatogobius lophius* Herre. After Herre.

Habitat: Sulu Islands (Bungau!). — Philippines (Panay, Luzon).

Type and cotype seen in Bureau of Science, Manila.

16. **Callogobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. nat. 9, 1874, p. 318)

Macgregorella Seale, Philipp. Journ. Sci. 4, no. 6, 1909, p. 533.
Doryptena Snyder, Proc. U.S. Nat. Mus. 35, 1909, p. 102.
Mucogobius McCulloch, Rec. West. Austral. Mus. 1, 1912, p. 93.
Ulcigobius Fowler, Proc. Ac. Nat. Sci. Philadelphia 70, 1918, p. 69.
Galera Herre, Monogr. 23 Bur. Sci. Manila, 1927, p. 104.
Gunnamatta Whitley, Rec. Austral. Mus. 16, 1928, p. 225.
Metagobius Whitley, Australian Zoologist 6, 1930, p. 122.
Herrea Whitley, o.c., p. 123 (substitute name for *Galera*).
Crossogobius (Museum name?) Koumans, Prel. Rev. Gobioid Fishes 1931, p. 111.
Batracheleotris Fowler, Proc. U.S. Nat. Mus. 85, 1938, p. 129.

Body elongate, anteriorly subcylindrical, posteriorly compressed, covered with 25-75 scales, which are ctenoid posteriorly and becoming cycloid anteriorly, or wholly cycloid; somewhat irregularly placed. Belly and breast scaled. Head depressed, broader than deep, with cutanian papillae, scaled above behind the eyes, cheek and opercle scaled with small cycloid scales or naked. Eye looking upwards. Bony interorbital narrow, about $^{1}/_{2}$ eyediameter to about 1 eyediameter. Snout as long as, to a little longer than eye. Anterior nostril in a long tube. Mouth small, oblique, lower jaw prominent. Teeth in both jaws in several rows, the outer of which is enlarged, no canines. Tongue rounded, sometimes slightly emarginate. Some transversal and longitudinal ridges on head. Gillopenings not very wide, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 7-15; A. I. 7-12. Basal membrane of ventral fin very weakly or not developed, bases united, the membrane between the inner rays is very weakly developed, often torn. Pectoral fin without free silklike rays, base scaled. Caudal fin lanceolate to oblong.

Distribution: India to the Pacific.

Key to the Indo-Australian species of Callogobius

1. All scales of body cycloid. Cheek and opercle naked. Interorbital as broad as, or a little narrower than eye ($^{5}/_{6}$) . . . . 1. *C. liolepis* p. 97.
2. Scales posteriorly ctenoid, anteriorly cycloid. Interorbital much narrower than eye (about $^{1}/_{3}$).
   A. 40-45 scales in L.l., 15-16 in L.tr. Basal membrane of ventral fin present or absent. 2. *C. hasseltii* p. 98.

B. 28 scales in L.l., 10 in L.tr. Basal membrane of ventral fin weak. 10-12 predorsal scales. 3. *C. centrolepis* p. 100.
C. ± 30 scales in L.l., 11-13 in L.tr. Basal membrane of ventral fin absent. About 15 predorsal scales . . . . 4. *C. sclateri* p. 100.
D. 28-30 scales in L.l., 9-10 in L.tr. Basal membrane of ventral fin present. About 8 predorsal scales . . . . 5. *C. snelliusi* p. 102.

1. **Callogobius liolepis** (Blkr.) Koumans

Callogobius liolepis (coll. Bleeker in Leiden Mus.) Koumans, Prel. Rev. Gobioid Fishes 1931, p. 75. — Zool. Meded. Leiden 15, 1932, p. 14.
Macgregorella santa Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 416. — o.c. 21, 1936, p. 352, fig. 19.
Macgregorella santa Koumans, Zool. Meded. Leiden 22, 1940, p. 138 (as synonym).

D. 1 VI; D. 2 I. 8-9; A. I. 8-9; P. 21; L.l. ± 45; L.tr. 12; Predorsal scales ± 17.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $6^{1}/_{2}$-7 in length, $7^{1}/_{2}$-8 in total length. Head depressed, $3^{1}/_{2}$ in length, $4^{1}/_{4}$ in total length. Eye about 5 in head, interorbital as broad as diameter of eye or a little narrower. Snout longer than eye, tip before eye. Nostrils tubular. Mouth oblique, lower jaw prominent. Maxillary extends to a little behind eye. Teeth in several rows, outer a little enlarged. Tongue rounded. Gillopenings a little continued forward below, isthmus moderate. Head with papillae and folds. Two longitudinal mucous canals on cheek, one around lower part of eye. Two short ones on opercle. Head scaled above behind eye, cheek and opercle naked. All scales of body cycloid. First dorsal fin obtuse, lower than body, middle rays are the longest. Second dorsal and anal fin higher than first dorsal fin, pointed posteriorly. Pectoral fin pointed, about as long as head. Ventral fin a little shorter, basal membrane very weak. Caudal fin oblong, not longer than head. Colour dusky green above, lighter below. Head and body with clouded black dots. These dots form laterally on body irregular transverse stripes. Dark dots at the bases of dorsal fins. Rays of dorsal fins, pectoral and caudal fin spotted. A black blotch on basal part of pectoral and caudal fin. Length 65 mm.

Habitat: Flores (Endeh!); Timor!; Halmahera (Ake Selaka at Kau Bay!); Ambon!; Haruku!. — New Hebrides (Hog Harbour!), Solomon Islands.

Types of *Callogobius liolepis* seen in the Leiden Museum, type of *Macgregorella santa* seen in Field Museum Nat. Hist, Chicago.

2. **Callogobius hasseltii** (Blkr.) (Fig. 20, p. 99)

Eleotris Hasseltii Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, p. 253, pl. fig. 13.
Eleotriodes Hasseltii Bleeker, Act. Soc. Indo-Neerl. 6, 1859, p. 112.
Eleotris hasseltii Günther, Cat. Fishes 3, 1861, p. 116.
Valenciennea Hasseltii Bleeker, Versl. Ak. Amsterdam (2) 2, 1868, p. 275.
Valenciennesia Hasseltii Bleeker, o.c. p. 300.
Gobius mucosus Günther, Proc. Zool. Soc. London 1871, p. 663, pl. 63 fig. A.
Gobius (Oxyurichthys) coelidotus (Cuvier & Valenciennes M.S.) Sauvage, Bull. Soc. Philom. Paris (7) 4, 1880, p. 50.
Gobius depressus Ramsay & Ogilby, Proc. Linn. Soc. N.S. Wales (2) 1, 1886, p. 4.
Doryptena okinawae Snyder, Proc. U.S. Nat. Mus. 35, (1908) 1909, p. 103. — o.c. 42, 1912, pl. 67 fig. 2.
Macgregorella moroana Seale, Philipp. Journ. Sci. § A 4, 1909, p. 533.
Mucogobius mucosus McCulloch, Rec. West Austral. Mus. 1, 1912, p. 93.
?*Callogobius* [*Hasseltii* (Blkr.)?] M. Weber, Nova Guinea 9, Zool. 4, 1913, p. 601.
Callogobius Hasseltii M. Weber, Siboga Exp. Fisches 1913, p. 480, fig. 98.
Callogobius hasseltii McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 217.
Callogobius hasseltii var. *mucosus* McCulloch & Ogilby, o.c. p. 217, pl. 32 fig. 4.
Macgregorella intonsa Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 100, pl. 7 fig. 2.
Macgregorella moroana Herre, o.c. p. 102, pl. 28 fig. 1.
Callogobius hasseltii Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 408.
Callogobius hasselti Koumans, Zool. Meded. Leiden 18, 1934, p. 134.
Macgregorella badia Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 415. — o.c. 21, 1936, p. 352, fig. 18.
Callogobius hasselti Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 83 (pro parte).
Doryptena okinawae Koumans, Zool. Meded. Leiden 22, 1940, pp. 127, 145 (as synonym).
Macgregorella badia Koumans, o.c. pp. 138, 155 (as synonym).
Callogobius mucosus, holotype of *Gobius depressus* Koumans, o.c. p. 160 (as synonym).
Macgregorella intonsa Koumans, o.c. pp. 155, 183 (as synonym).
Macgregorella moroana Koumans, o.c. pp. 155, 183 (as synonym).
Callogobius hasseltii Koumans, Mem. Indian Mus. 13, 1941, p. 236.

D. 1 VI; D. 2 I. 9-10; A. I. 7-8; P. 16-18; L.l. 40-45 (55); L.tr. 15-16; Predorsal scales 20.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $5^3/_4$-6 in length, $7^1/_2$-8 in total length. Head pointed, depressed, 4 in length, $4^2/_3$-$5^1/_3$ in total length. Profile convex. Eye $3^1/_2$-$3^1/_3$ in head, interorbital $^1/_3$ eyediameter. Snout convex, shorter than eye, tip before eye. Anterior nostril tubular. Mouth very oblique, lower jaw prominent. Maxillary does not reach eye or to below anterior margin of eye. Teeth of outer row enlarged. Tongue rounded. Gillopenings not to a little continued forward below, isthmus broad. Head with rows of papillae and folds on snout, cheek and opercle. A number of transversal folds under lower jaw. Head scaled above behind the eyes and on cheek and opercle with cycloid scales. Sometimes scales of head rudimentary. Scales of body enlarged posteriorly, ctenoid. First dorsal fin obtuse, lower than body, middle rays are the longest. Second dorsal fin higher than the first, pointed posteriorly. Pectoral fin pointed, a little longer than head. Ventral fin not longer than head, basal membrane present or absent. Caudal fin lanceolate, longer than head. Colour of upper parts reddish green, lower parts orange. Head and body clouded with blackish. Body with 3-4 indistinct transverse bands. Fins yellowish. Dorsal fins and anal fin with transverse stripes. Pectoral and caudal fin with transverse stripes. A black ocellus on upper part of caudal fin may be present. Length 73 mm.

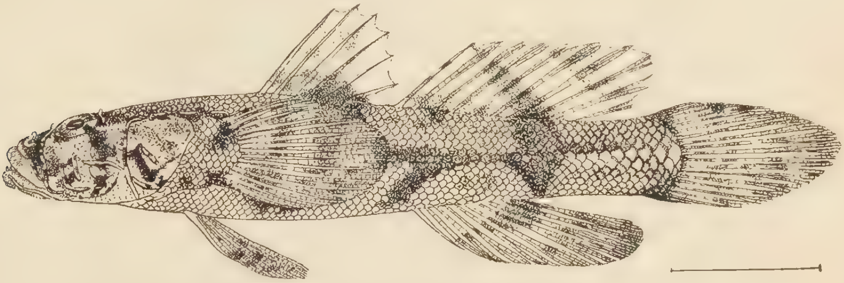

Fig. 20. *Callogobius hasseltii* (Blkr.). × 2. After M. Weber.

Habitat: Java! (Anjer); Lombok (Pidjot bay!, Labuan Pandan); Sumba (Southcoast!); Flores (Endeh!); Kera near Timor!; Sulu Islands (Jolo!, Sitankai!); Celebes (river near Paré Paré); Great Sangir (Taruna bay!); Talaud Islands (Beo!); Saleyer!; Sula Besi (Sanana!); Buru (Kajeli); Ambon; Banda; between Banda Neira and Gunung Api; Waigeu (Saonek!); New Guinea! (brook near Humboldt bay). — India!, Ceylon, Andamans!, Siam, Japan!, Philippines!, New Hebrides, Fiji!, Pelew Islands, Australia (Port Jackson!, St. Vincents Gulf!, Queensland). — In sea.

Type of *Eleotris hasseltii* seen in the Leiden Museum, type of *Gobius coelidotus* seen in Paris Museum, of *Doryptena okinawae* type seen in U.S. Nat. Museum, cotypes in Stanford University, of *Macgregorella badia* type seen in Field Museum Nat. Hist., cotype in Stanford University, types of *Macgregorella intonsa* and type of *M. moroana* seen in Bureau of Science, Manila, holotype of *Gobius depressus* seen in Australian Museum, Sydney.

3. **Callogobius centrolepis** M. Weber (Fig. 21, p. 101)

Callogobius centrolepis M. Weber, Notes Leyden Mus. 31, 1909, p. 157.

Siboga Exp. Fische 1913, p. 481, fig. 99.

D. 1 VI: D. 2 I. 7; A. I. 7; P. 16?; L.l. 28; L.tr. 10; Predorsal scales 10-12.

Body elongate, compressed, height $4^3/_4$ in length, 6 in total length. Head depressed, $3^1/_4$ in length, $3^4/_5$ in total length. Eye $3^1/_2$ in head, interorbital narrow. Snout shorter than eye, tip before middle of eye. Mouth oblique, lower jaw prominent. Maxillary extends to a little beyond anterior margin of eye. Teeth of outer row enlarged, 10-12 distant teeth. Tongue rounded. Scales of body cycloid anteriorly, ctenoid on hinder half of body. Head scaled above behind eyes, on cheek and opercle with large scales. Dermal folds before and between the eyes, at lower jaw and on opercle. Ventral fin a little shorter than distance from anterior margin of eye to posterior margin of opercle, basal membrane weak. Vertical fins shorter than height of body. Caudal fin oblong. Pectoral fin pointed, both fins shorter than head. Colour uniform brown. Fins darker, with lighter bands. Dorsal fins and anal fin with dark spots. Dermal folds of head brown. Length 49 mm.

Habitat: Bawean ($1^1/_2$ mile south of Tandjong Lajar!); Celebes (Lembeh Strait!).

Type seen in the Amsterdam Museum.

4. **Callogobius sclateri** (Steind.)

Eleotris sclateri Steindachner, Sitz ber. Ak. Wiss. Wien 80, 1, 1880, p. 157.
Gobiomorphus sclateri Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 384, fig. 73.
Drombus tutuilae, Jordan & Seale, o.c. p. 399, fig. 88.

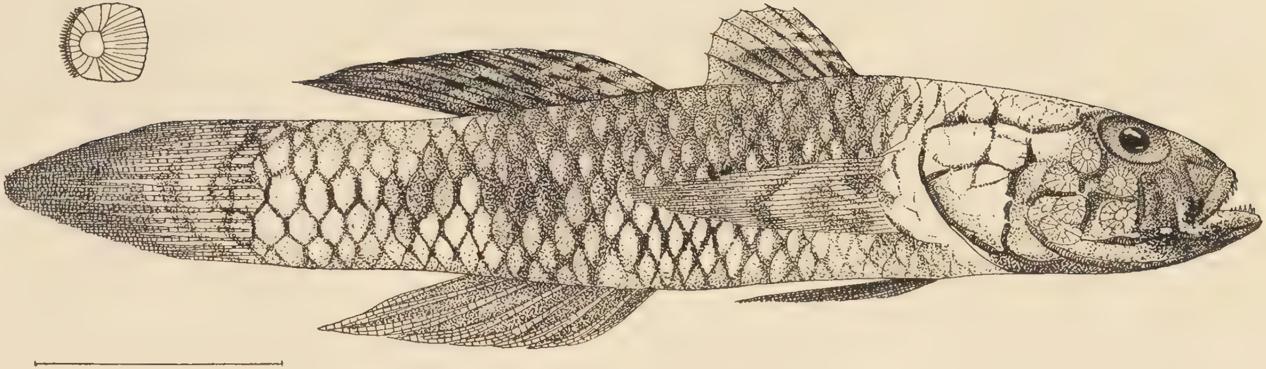

Fig. 21. *Callogobius centrolepis* M. Weber. × $3^1/4$. After M. Weber.

Callogobius sclateri McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 219, pl. 32 fig. 3.
Gobiomorphus illotus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 45, pl. 3 fig. 4.
Callogobius sclateri Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 408.
Drombus tutuilae Fowler, o.c. p. 411.
Metagobius sclateri Whitley, Australian Zoologist 6, 1930, p. 122.
Callogobius sclateri Herre, Field. Mus. Nat. Hist. Zool. 21, 1936, p. 362.
Batracheleotris sclateri Fowler, Proc. U.S. Nat. Mus. 85, 1938, p. 130.
Drombus tutuilae Koumans, Zool. Meded. Leiden 22, 1940, p. 125 (as synonym).
Gobiomorphus illotus Koumans, o.c. p. 182 (as synonym).
Mucogobius sclateri Schultz, Bull. 180 U.S. Nat. Mus. 1943, p. 246, 250.

D. 1 VI; D. 2 I. 9; A. I. 8; P. 17; L.l. ± 30; L.tr. 11 (13); Predorsal scales ± 15.

Body elongate, compressed, height $4^1/_2$ in length. Head $3^1/_2$ in length, depressed. Eye $4^1/_2$ in head, interorbital $2^1/_2$ in eyediameter. Snout as long as eye, tip before lower margin of eye. Mouth oblique, lower jaw prominent. Maxillary does not reach eye. Teeth in several rows, outer enlarged. Tongue rounded. Gillopenings not continued forward below, isthmus broad. Head with rows of papillae on snout, cheek and opercle. Head scaled above and on cheek and opercle with cycloid scales. Scales of body ctenoid, becoming cycloid anteriorly. First dorsal fin obtuse, lower than body, middle rays are the longest. Second dorsal fin as high as the first. Caudal fin oblong, as long as head. Basal membrane of ventral fin absent, inner rays only united at the bases. Colour light brown with two darker cross bands, one below each dorsal fin. Dorsal fins with dark blotches. Pectoral, anal and caudal fin with dark cross bands. Length 47 mm.

Habitat: Flores (Maumeri!); Timor (near Kupang!); Sulu Islands (Sitankai); Obi latu!. — Philippines (Polillo!), Tahiti, Samoa (Pago Pago!), New Hebrides, Fiji!, Solomon Islands, Society Islands, Queensland.

Type of *Drombus tutuilae* seen in U.S. Nat. Museum, type of *Gobiomorphus illotus* seen in Bureau of Science, Manila.

5. **Callogobius snelliusi** n. sp.

D. 1 VI; D. 2 I. 8; A. I. 6; P. 16; L.l. 28-30; L.tr. 9-10; Predorsal scales ± 8.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 4 in length, 5 in total length. Head a little depressed, $3^1/_4$ in length, more than 4 in total length. Eye 3 in head, interorbital narrow. Snout a little shorter than eye, tip before lower margin of eye. Mouth very oblique, lower jaw prominent. Maxillary does not reach anterior margin of eye. Teeth of outer row enlarged. Tongue rounded. Scales of body cycloid anteriorly, ctenoid posteriorly. Head scaled above behind the eye; cheek and opercle scaled? Dermal folds before and between the eyes, on cheek and opercle. At tip of lower jaw a few (about 3) transversal folds under head on each side. Two open pores in median line in interorbital. Gillopenings not continued forward below, isthmus broad. First dorsal fin lower than body, middle rays are the longest. Second dorsal and anal fin higher than first dorsal fin, pointed posteriorly. Pectoral fin oblong, about as long as head. Ventral fin a little shorter, basal membrane present. Caudal fin oblong, about as long as head. Colour in spirits brownish gray, many scales of body with a light centre. Folds on head dark. Dorsal fins, caudal and anal fin with light spots. Ventral fin dusky. Length 41 mm.

Habitat: Morotai!.

Types seen in the Leiden Museum.

17. **Redigobius** Herre

(Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 98)

Ostreogobius Whitley, Australian Zoologist 6 pt. 2, 1930, p. 122.
Cyprinogobius Koumans, Zool. Meded. Leiden 20, 1937, p. 11.

Body elongate, high, strongly compressed, covered with 25-30 scales, ctenoid on most parts of the body, cycloid on nape, breast and belly. Head compressed, scaled above behind the eyes with large scales; the first, unpaired one, in the median line behind eye is not much enlarged. Opercle scaled with large scales. Nape without fleshy crest. Bony interorbital less than 1 eyediameter. Maxillary prolonged to behind the eye or not prolonged (sexual dimorphism?). Mouth oblique. Teeth in several rows, outer row a little enlarged, some teeth caninoid. Tongue rounded to truncate. A number of short mucous canals radiate under eye, one to two longitudinal mucous canals on cheek. One open pore on each side medially of posterior nostril, three in interorbital space, one behind each eye, some along posterior margin of preopercle. Gillopenings extend to a little below base of pectoral fin, isthmus moderate. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 6-7; A. I. 6-7. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin rounded, as long as or shorter than head.

Distribution: Indo-Australian Archipelago, Philippines, Australia.

Key to the Indo-Australian species of Redigobius

1. 27-30 scales in L.l.; L.tr. 8; Predorsal scales 10; D. 2 I. 7; A. I. 7 . . . . 1. *R. dispar* p. 104.
2. 25 scales in L.l.; L.tr. 7; Predorsal scales 7; D. 2 I. 6; A. I. 6 . . . . 2. *R. chrysosoma* p. 105.

1. **Redigobius dispar** (Peters)

Gobius dispar Peters, Monatsber. Ak. Wiss. Berlin 1868, p. 264.
Gobius sternbergi H. M. Smith, Bull. U.S. Fish Comm. 21, (1901) 1902, p. 169, fig.
Gnatholepis sternbergi Seale & Bean, Proc. U.S. Nat. Mus. 33, 1908, p. 248.
Redigobius sternbergi Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 98.
Vaimosa dispar Herre, o.c. p. 142.
Cyprinogobius dispar Koumans, Zool. Meded. Leiden 20, 1937, p. 13.
?*Pseudogobius dispar* Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 164.
Gobius sternbergi Koumans, Zool. Meded. Leiden 22, 1940, p. 128 (as synonym).
Redigobius dispar Koumans, o.c. p. 137.
Vaimosa dispar Koumans, o.c. p. 185 (examination of specimens).

D. 1 VI; D. 2 I. 7; A. I. 7; L.l. 27-30; L.tr. 8-9; Predorsal scales 10.

Body oblong, strongly compressed, height 3-3$^1/_2$ in length in males, 3$^1/_2$-4$^1/_4$ in length in females. Head compressed, 2$^6/_7$-3$^1/_3$ in length in males, more than 3-3$^3/_4$ in females, Eye 3-4.8 in head, interorbital $^1/_2$ eyediameter or less. Snout rounded, 3$^1/_4$ to more than 4 in head in males, 4$^1/_4$-5 in head in females. Mouth oblique, jaws equal. In male maxillary extends to posterior margin of eye or further, in female maxillary extends to below anterior margin of eye or middle of eye. Teeth in several rows, outer row in upper jaw enlarged. In lower jaw inner row enlarged laterally. Head scaled above from behind the eyes, the first scale is an unpaired enlarged one in the median line. Preopercle naked, opercle scaled with large cycloid scales. Scales of body ctenoid, becoming cycloid above opercle. Dorsal fins separate. Middle rays of the low first dorsal fin are the longest. Caudal fin rounded, a little shorter than head. Colour dark brown or blackish to yellowish with a dark spot on shoulder, followed by a row of 8-10 dark spots to base of caudal fin. In males sides and lower part of head with light spots or lines. Top of snout and interorbital dark brown. A dark spot on posterior part of upper margin of eye. Fins dusky or brown. First dorsal fin with light band across middle and light upper margin. Second dorsal and anal fin with three light bars. Length 55 mm.

Habitat: Java (Old Harbour canal of Djakarta!). — Philippines (Lake Buhi!).

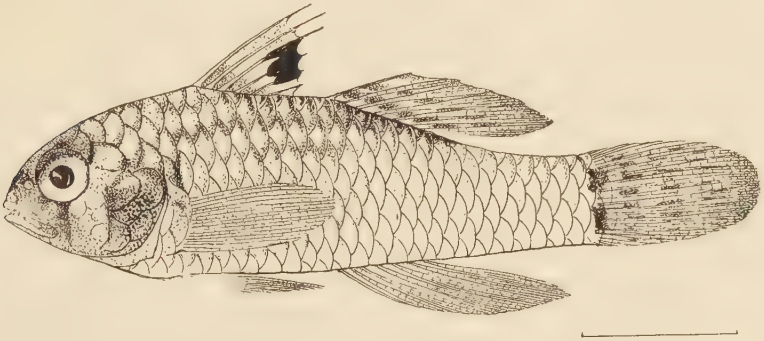

Fig. 22. *Redigobius chrysosoma* (Blkr.) × 2. After M. Weber.

Types of *Gobius sternbergi* seen in U.S. Nat. Museum. A female specimen of 55 mm from the Old Harbour canal of Batavia, collected by Carl L. Hubbs, was brought by Koumans, 1940, p. 137, to this species.

2. **Redigobius chrysosoma** (Blkr.) (Fig. 22, p. 105)

Lophogobius chrysosoma Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 114.
Gobius (Acentrogobius) leptochilus M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 41, fig. 10 (not of Blkr.).
Vaimosa bikolana Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 151, pl. 11 fig. 2.
Cyprinogobius chrysosoma Koumans, Zool. Meded. Leiden 20, 1937, p. 12.
?*Pseudogobius bikolanus* Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 161, fig. 19.
Vaimosa bikolana Koumans, Zool. Meded. Leiden 22, 1940, p. 185 (as synonym).
Vaimosa bikolana Herre, Philipp. Journ. Sc. 72 no. 4, 1940, p. 368.

D. 1 VI; D. 2 I. 6; A. I. 6; P. 17; L.l. 25; L.tr. 7; Predorsal scales 7.

Body oblong, strongly compressed, height 3 in length, $3^3/_4$-4 in total length. Head strongly compressed, obtuse, $3^2/_3$ in length, $4^2/_5$-$4^2/_3$ in total length. Profile a little convex. Eye 3-$3^1/_4$ in head, interorbital $^1/_3$ eyediameter. Snout obtuse, half as long as the eye, tip before to below inferior margin of eye. Mouth small, jaws subequal, maxillary extends to below middle of eye. Teeth in many rows, in upper jaw outer row enlarged, in lower jaw outer row enlarged, extends to halfway the jaw; no canines. Head scaled above from behind the eyes, the first scale is an unpaired one in the median line, scarcely larger than the following predorsal scales. Preopercle naked, opercle with some large cycloid scales. Scales of body ctenoid, on head behind eyes cycloid. Gillopenings extend to a little below base of pectoral fin. Dorsal fins separate. First dorsal fin pointed, half as high as body, middle rays are the longest. Second dorsal and anal fin not longer than first dorsal fin, a little lower than body, rounded posteriorly. Pectoral fin rounded, not shorter than head. Ventral fin a little shorter than head. Caudal fin obtuse, about as long as head. Colour of body orange red, each scale of dorsal part of body with a dark stripe near the margin. Head with two transversal dark stripes, the first from eye to maxillary, the second to behind corner of mouth. An oblique dark stripe on opercle. Fins reddish. First dorsal fin with black spot between third and fifth ray. Rays of second dorsal and caudal fin spotted. Two dark spots in a vertical line at the base of caudal fin. Length 49 mm.

Habitat: Borneo (Bandjermasin!, British North Borneo); ?Celebes (Boloang and Sabang); ?Talaud Islands (Lirung); Ambon; Aru Islands (Seltutti on Kobroor!). — Philippines (Albay Prov.!, Bohol).

Types of *Lophogobius chrysosoma* seen in the Leiden Museum, type of *Vaimosa bikolana* seen in Bureau of Science, Manila.

18. **Waitea** Jordan & Seale

(Jordan & Seale, Bull. Bur. Fisheries 25 (1905) 1906, p. 407)

Mahidolia H. M. Smith, Journ. Siam Soc. Nat. Hist. Suppl. 8 no. 4, 1932, p. 255.
Rictugobius (Koumans M.S.) H. M. Smith, o.c. p. 258.

Body elongate, compressed, scaled with 30-40 scales, ctenoid posteriorly, becoming cycloid anteriorly. Head a little compressed, naked. Eye large, interorbital narrow. Snout about as long as eye. Mouth a little oblique, wide; jaws subequal. Maxillary prolonged posteriorly to halfway preopercle. Teeth in both jaws in several rows, outer row a little enlarged. In lower jaw inner row enlarged. No canines. Tongue rounded. Gillopenings continued forward below, isthmus narrow. No fleshy flaps on inner edge of shouldergirdle. Dorsal fins very close together. First dorsal fin with 6 rays. D. 2 I. 10; A. I. 9. Ventral fins united, oblong. Pectoral fin without free silklike rays, base naked. Caudal fin obtuse to oblong.

Distribution: East coast of Africa to Japan, the Philippines and Australia.

1. **Waitea mystacina** (C.V.) (Fig. 23, p. 108)

Gobius mystacinus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 124.
Gobius pulverulentus (Kuhl & v. Hasselt) Cuvier & Valenciennes, o.c. p. 125.
Gobius mystacinus Günther, Cat. Fishes 3, 1861, p. 48.
Gobius maxillaris Macleay, Proc. Linn. Soc. N.S. Wales 2, 1878, p. 357, pl. 9 fig. 2.
?*Waitea mystacina* Jordan & Richardson, Bull. Bur. Fisheries 27, (1907) 1908, p. 279.
Waitea parvida Tanaka, Dobuts, Z. Tokyo 27, 1915, p. 567.
Waitea maxillaris McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 250, pl. 35 fig. 3.
Waitea mystacina Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 208.
Waitea mystacina Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 415.
Mahidolia normani H. M. Smith & Koumans, Journ. Siam Soc. Nat. Hist. Suppl. 8 no. 4, 1932, p. 256, pl. 23.
Waitea mystacina Koumans, Zool. Meded. Leiden 18, 1935, pp. 129, 130, 133, fig. 2.
Waitea mystacina Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 77, fig. 28.
Waitea maxillaris Koumans, Zool. Meded. Leiden 22, 1940, p. 158 (as synonym).

D. 1 VI; D. 2 I. 10; A. I. 9; P. 16-17; L.l. 37; L.tr. 13-15; Predorsal scales ± 8.

Body elongate, compressed, height $4^1/_3$ in length. Head compressed, 3-$3^1/_2$ in length. Dorsal profile convex. Eye 3-$3^1/_2$ in head, interorbital very narrow, about $^1/_4$ eyediameter. Snout oblong, shorter than eye, tip before inferior margin of eye. Jaws subequal. Maxillary prolonged to halfway preopercle or to posterior border of preopercle. Teeth in both jaws in several rows, outer row a little enlarged, in lower jaw inner row enlarged. No canines. Tongue rounded. Some short mucous canals under eye, some longitudinal ones on cheek. Scales of body ctenoid posteriorly, cycloid anteriorly. Head naked, nape naked, except some scales just before insertion of first dorsal fin. Breast scaled. First ray of first dorsal fin filiform, the other rays decreasing in length. Second dorsal and anal fin high, the posterior rays are a little prolonged, reaching the caudal fin. Caudal fin obtuse to oblong. Pectoral fin pointed, base naked. Colour in spirits light brown. Body with about eight transverse bands, which are a little obliquely placed. Head and anterior part of body with dark dots. Pectoral fin dark. Tip of first dorsal fin black, on the fin some dark bands. Second dorsal fin indistinctly spotted. Anal fin with a pale band near margin. Length 80 mm.

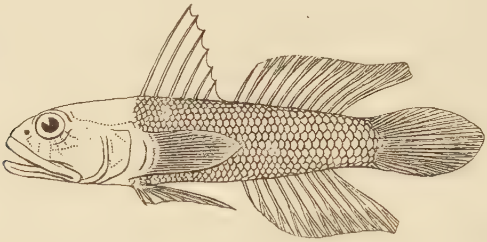

Fig. 23. *Waitea mystacina* (C.V.). n.s. After Koumans.

Habitat: Java!; Bali (Den Pasar!); Ambon!. — East coast of Africa (Dar-es-Salaam!), Siam (Chantabun estuary!); Japan, Philippines (Iloilo on Panay!, ?Aparri on Luzon), Australia (Port Darwin!).

Type of *Gobius mystacinus* seen in Paris Museum, type of *Waitea maxillaris* seen in Macleay Museum, Sydney.

19. **Stigmatogobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 323)

Pseudogobius Bleeker (Museum name).
Microgobius Bleeker (Museum name, not of Poey).
Vaimosa Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 141 (pro parte).
Parvigobius Whitley, Austral. Zoologist 6, 1930, p. 122.
Ellogobius (*Lizagobius*) Whitley, Rec. Austral. Mus. 19, 1933, p. 93.
Pseudogobiopsis Koumans, Zool. Meded. Leiden 18, 1935, p. 131.
Pseudogobius (Bleeker) Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 158.

Body elongate, a little compressed, covered with 25-32 scales, ctenoid on the posterior part of body, becoming more cycloid on the anterior part, breast and belly scaled. Head a little compressed to depressed, scaled above behind the eyes; the foremost scale is a large unpaired one in the median line. Cheek and opercle or only opercle scaled. Interorbital $^{1}/_{3}$-$1^{1}/_{2}$ eyediameter. Snout short, blunt, shorter than eye. Anterior nostril in a short tube. Mouth oblique, lower jaw or upper jaw prominent. Maxillary prolonged behind or not (sexual character in some species). Teeth in both jaws in several rows, the outer of which is enlarged. The outer row of lower jaw extends to halfway the jaw, the last tooth is not stronger developed. In lower jaw sometimes on each side of symphysis a canine of inner row, laterally sometimes inner row enlarged. Tongue rounded to feebly emarginate. Gillopenings not wide, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 6-8; A. I. 6-8. Ventral fins united. Pectoral fin without free silklike rays, base scaled. Caudal fin obtuse.

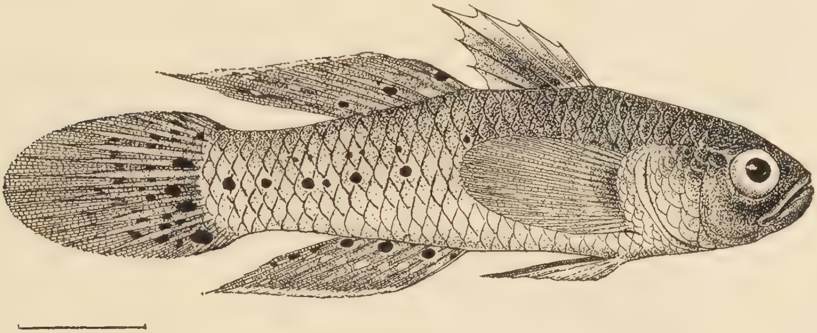

Fig. 24. *Stigmatogobius sadanundio* (H. B.). × $1^{2}/_{3}$.

Distribution: India to the Pacific.

Key to the Indo-Australian species of Stigmatogobius

1. 6-9 predorsal scales.
  A. Lower jaw prominent.
    a. Teeth of inner row of lower jaw laterally enlarged.
      a'. Interorbital broader than eye. Body with one or some longitudinal rows of black spots. First dorsal fin with large black spot between 4th and 6th ray . 1. *S. sadanundio* p. 111.

b'. Interorbital less than $^1/_2$ eyediameter. Head with 3-4 oblique dark streaks. Body with two alternating longitudinal rows of each 10 spots. First dorsal with 2-3 longitudinal stripes . . . 2. *S. tambujon* p. 112.

b. Teeth of inner row of lower jaw laterally not enlarged. Maxillary in male to behind eye, in female to below middle of eye . . . . 3. *S. römeri* p. 113.

B. Jaws subequal.

a. Head compressed. Interorbital ½ eyediameter. L.l. 25-26 . . . . 4. *S. isognathus* p. 115.

b. Head depressed. Interorbital less than 1 eyediameter. L.l. 28 . . . . 5. *S. oligactis* p. 116.

C. Upper jaw prominent.

a. Preopercle and opercle scaled.

a'. L.l. ± 26; L.tr. 7; Predorsal scales 7. 6. *S. gastrospilos* p. 117.

b'. L.l. 32; L.tr. 9; Predorsal scales 8-9. 7. *S. mingi* p. 118.

b. Preopercle naked, opercle scaled.

a'. Teeth of inner row of lower jaw laterally enlarged.

α. Dark spots of body placed in 2 longitudinal alternating rows . . 8. *S. poicilosoma* p. 119.

β. Dark markings placed in a network. 9. *S. reticularis* p. 120.

b'. Teeth of inner row laterally not enlarged.

α. Maxillary extend to below posterior part of eye.

α'. Back and sides with irregular dark spots. First dorsal fin with 2 oblique black bars . . 10. *S. amblyrhynchus* p. 121.

β'. Back with 3 brown transversal bands. First dorsal fin with dark band and a dark spot between 3rd, 4th and 5th rays. . 11. *S. oyensi* p. 122.

β. Maxillary extends to below anterior margin of pupil. Body with 2-3 alternating longitudinal rows of each 5 blotches. Below first dorsal fin a dark stripe obliquely forward. First dorsal fin with dark spot between 3rd and 5th rays. . 12. *S. javanicus* p. 122.

2. More than 9 predorsal scales.

A. Interorbital less than $^1/_2$ eyediameter. 10-11 predorsal scales . . . . 13. *S. penango* p. 124.

B. Interorbital more than eyediameter.

a. Head depressed. 11-13 predorsal scales. 14. *S. hoevenii* p. 125.

b. Head compressed. 13-14 predorsal scales. 15. *S. borneensis* p. 127.

1. **Stigmatogobius sadanundio** (H. B.). (Fig. 24, 25, p. 109, 111)

Gobius sadanundio Hamilton Buchanan, Gangetic Fishes 1822, pp. 52, 366.
Gobius pleurostigma Bleeker, Verh. Bat. Gen. 22, 1849, p. 28.
Gobius apogonius Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1164.
Gobius sadanundio Bleeker, Verh. Bat. Gen. 25, 1853, p. 102, pl. 2 fig. 2.
Gobius apogonius Günther, Cat. Fishes 3, 1861, p. 28.
Gobius sadanundio Günther, o.c. p. 29.
Gobius pleurostigma Günther, o.c. p. 43.
Stigmatogobius sadanundio Bleeker, Versl. Ak. Amsterdam (2) 12, 1878, p. 201.
Gobius sadanundio Day, Fishes India 1878, p. 296, pl. 63 fig. 10. — o.c. Suppl. 1888, p. 793. — Fauna Brit. India Fishes 2, 1889, p. 268, fig. 90.
Gobius sadanundio Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 403.
Gobius sadanundio Hora, Mem. Indian Mus. 9 no. 4, 1929, pl. 18 fig. 3.
Stigmatogobius sadanundio Koumans, Zool. Meded. Leiden 15, 1932, p. 3.
Vaimosa spilopleura H. M. Smith, Journ. Siam. Soc. Nat. Hist. Suppl 9 no. 1, 1933, p. 66, pl. 2 fig. 2.
Stigmatogobius sadanundio Koumans, Zool. Meded. Leiden 19, 1937, p. 178.— Mem. Indian Mus. 13, 1941, p. 261.
Vaimosa spilopleura Fowler, Proc. Ac. Nat. Sci. Philadelphia 89, 1937, p. 252, fig. 279.

D. 1 VI; D. 2 I. 7; A. I. 8; P. 18-19; L.l. ± 28; L.tr. 8-9; Predorsal scales 8-9.

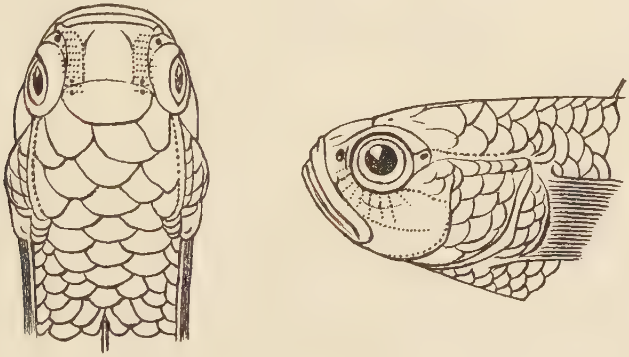

Fig. 25. *Stigmatogobius sadanundio* (H. B.). × 2. After Koumans.

Body elongate, compressed, height $3^{3}/_{4}$-4 in length, $4^{2}/_{3}$-5 in total length. Head subcylindrical, $4^{1}/_{3}$-5 in length. Eye 3-4 in head, interorbital 1-$1^{1}/_{2}$ eyediameter. Snout shorter than eye, tip before middle to lower half of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below middle of eye. Teeth in several rows, outer a little enlarged. In lower jaw inner row enlarged, forming a caninus on each side of symphysis and caninoid teeth laterally. Tongue rounded. Some short mucous canals radiate under eye. Head scaled above behind eye, opercle scaled with large scales. Foremost scale behind eye is enlarged. Scales of head and nape cycloid, of body ctenoid. First dorsal fin lower than body, third and fourth rays are the longest, prolonged. Second dorsal and anal fin pointed posteriorly. Pectoral fin oblong, about as long as head. Ventral fin a little shorter. Caudal fin obtuse, a little longer than head. Colour in spirits yellowish. Body with a number of black spots in one or a few lines longitudinally in middle of the sides. A few black spots at the insertion of caudal rays. First dorsal fin with dark blotches between fourth and sixth ray. Second dorsal and anal fin with 3-4 dark spots, surrounded by a narrow white ring on basal half of the finmembrane. Caudal fin with small black spots. Middle rays of ventral fin black. Length 85 mm.

Nom. indig: Lĕntir (Tambak).

Habitat: Singapore!; Pulu Weh!; Sumatra (Padang Deli!); Java (Surabaja!, Tambak Sumur!); Madura (Kammal!); Borneo (Bandjermasin, Sarawak). — India!. Ceylon!, Sim, Malay Peninsula to Fiji Islands, Kanathia. — In fresh and brackish water.
Types of *Gobius apogonius* seen in British Museum (N.H.).

Note: One specimen from Padang Deli has 3 scales on upper part of cheek.

2. **Stigmatogobius tambujon** (Blkr.)

Gobius tambujon Bleeker, Nat. Tijdschr. Ned. Indië 7, 1854, p. 319.
Gobius tambujon Günther, Cat. Fishes 3, 1861, p. 32.
Glossogobius tambujon Jordan & Seale, Proc. U.S. Nat. Mus. 35, 1908, p. 542.
Gobius tambujon Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 403 (pro parte).
Stigmatogobius tambujon Koumans, Zool. Meded. Leiden 15, 1932, p. 10.
Stigmatogobius tambujon Herre, Philipp. Journ. Sci. 72 no. 4, 1940, p. 368.

D. 1 VI; D. 2 I. 6; A. I. 6; P. 16; L.l. ± 26; L.tr. 7; Predorsal scales 8?.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_4$ in length, $5^1/_2$ in total length. Head a little compressed, 3 in length, 4 in total length. Profile convex. Eye 5 in head, interorbital $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip before inferior margin of eye. Mouth a little oblique, lower jaw prominent. Maxillary extends to below posterior margin of pupil. Teeth in front in several rows. In lower jaw laterally a few rows, of which the inner is a little enlarged. No canines. Tongue truncate. Two longitudinal mucous canals on cheek. No pore in interorbital. No pore behind eye. Head scaled above behind eye, opercle scaled? Scales of head, neck, breast and belly cycloid, other scales ctenoid. First dorsal fin lower than body. Pectoral fin a little shorter than head, upper rays free? Ventral fin a little shorter than pectoral fin. Caudal fin obtuse, much shorter than head. Colour green above, reddish green below. Head with 3-4 oblique dark streaks. Laterally on body two alternating longitudinal rows of each 10 spots. First dorsal fin with 2-3 longitudinal stripes. Rays of caudal fin spotted. Ventral fin and lower part of anal fin dark. Length 35 mm.

Nom. indig.: Tambujon (Sundan.).

Habitat: Java (Perdana, Djakarta!, Buitenzorg!); Bali; Borneo (Pontianak, Gunung Ambawang). — Philippines (Bumaguete!). — In rivers and brackish water.

Specimen of Bleeker's collection seen in the Leiden Museum.

3. **Stigmatogobius römeri** (M. Weber) (Fig. 26, p. 114)

Pseudogobius neglectus coll. Bleeker in Leiden Museum.
Gobius spec., M. Weber, Zool. Ergebnisse 3, 1894, p. 413.
Gobius tambujon M. Weber, Nova Guinea 5, Zool. 2, 1908, p. 259 (not of Blkr.).
Gobius Römeri M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 39, fig. 8. — Siboga Exp. Fische 1913, p. 459.
Vaimosa macrognathos Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 145, pl. 10 fig. 2.
Gobius römeri Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 403.
Stigmatogobius neglectus Koumans, Zool. Meded. Leiden 15, 1932, p. 5.
Vaimosa koumansi Mukerji, Rec. Indian Mus. 37 pt. 3, 1935, p. 268, pl. 6 figs. 3-4.
Pseudogobiopsis römeri Koumans, Zool. Meded. Leiden 18, 1935, p. 132. — Mem. Indian Mus. 13, 1941, p. 244.
Vaimosa osgoodi Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 420.— o.c. 21, 1936, p. 359, fig. 32.
Vaimosa horiae Herre, Philipp. Journ. Sci. 59 no. 2, 1936, p. 280 (pro parte?).
?*Vaimosa brocki* Herre, Bull. Raffles Mus. 12, 1936, p. 9, pl. 5.
Vaimosa osgoodi Koumans, Zool. Meded. Leiden 22, 1940, p. 138 (as synonym).
Vaimosa horiae Koumans, o.c. p. 150 (as synonym).
Vaimosa brocki Koumans, o.c. p. 151 (as probable synonym).
Vaimosa macrognathos Koumans, o.c. p. 185 (as synonym).
Stigmatogobius neglectus Koumans, Rec. Indian Mus. 42, 1940, p. 16. — Mem. Indian Mus. 13, 1941, p. 262.

D. 1 VI; D. 2 I. 6-7; A. I. 6; P. 17-18; L.l. 26-28; L.tr. 7-8; Predorsal scales 7-8.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 4-5 in length, 5-6 in total length. Head subcylindrical to compressed, 3 in length in males, $3^2/_5$-$3^1/_2$ in length in females. Profile convex. Eye 3-$4^1/_2$ in head, interorbital $^1/_3$-$^1/_2$ eyediameter. Snout obtuse, shorter than eye, tip before to below lower margin of eye. Mouth a little oblique, lower jaw a little prominent. Maxillary extends to below middle of eye in females, to behind eye in males. Teeth in front in several rows, outer row a little enlarged. No canines. Tongue rounded to feebly emarginate. Two mucous canals longitudinally on cheek. Open pores in interorbital indistinct. Open pore behind eye at the beginning of supraopercular groove. Head scaled above behind eye, opercle scaled. Scales of head, nape, breast and belly cycloid, other scales ctenoid. First dorsal fin as high as body in males, lower than body in females, second and third rays are the longest, in males sometimes filiform. Second dorsal and anal fin lower than body. Pectoral fin obtuse, about as long as head. Ventral fin rounded, shorter than pectoral fin. Caudal fin rounded. Colour of male yellowish, body with two alternating rows of dark brown spots on the dorsal half. Two dark spots in a vertical line at the base of caudal fin. Head with bent brown transverse bands. First dorsal fin with dark band halfway and dark margin. Second dorsal fin with 2-4 longitudinal dark bands. Caudal fin with some dark irregular transverse bands. Colour of female olivous above, lighter below. Head and body with small spots. Fins yellowish. First dorsal fin with 2-3 longitudinal dark streaks, one of these forming a black blotch posteriorly on fin. Rays of second dorsal and caudal fin spotted. Length 45 mm.

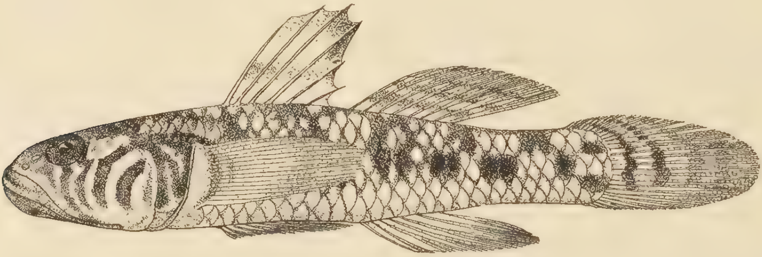

Fig. 26. *Stigmatogobius römeri* (M. Weber). × $2^1/_2$. After M. Weber.

Nom. indig.: Båså, Gĕdangan (Jav.).

Habitat: ?Singapore!; Simalur (Kali Gunung Batu Sinabang!); Java (Djakarta!, Bantam!, river Sliling); Sulu Islands (Bungau); Celebes (river near Palopo!, Rumbia!); Saleyer (river Bangkalan!); Obi major (Laiwui!); Aru Islands (Wokam!); Waigeu; New Guinea (Merauke!). — Andamans!, Philippines (Luzon, Lake Bourbon!), Pelew Islands!, Fiji (river near Suva!), Queensland (Brisbane!). — In sea and rivers.

Types of *Stigmatogobius neglectus* seen in the Leiden Museum, type of *Gobius römeri* seen in the Amsterdam Museum, type of *Vaimosa osgoodi* seen in Field Museum Nat. Hist., type of *Vaimosa horiae* and type of *V. brocki* seen in Stanford University, type and cotypes of *Vaimosa macrognathos* seen in Bureau of Science, Manila.

Note: Koumans stated in Zool. Meded. Leiden 22, 1940, p. 150 for *Vaimosa horiae* Herre, that the male specimens of that species belong to *Pseudogobiopsis römeri* (M. Weber), while the female specimens belong to *Stigmatogobius*. In the same way he states in Rec. Indian Museum 42, 1940 p. 16 (On a collection of Gobioid Fishes from the Andamans and in Mem. Indian Mus 13, 1941 p. 262 (Gobioid Fishes of India), that it is possible that *Stigmatogobius neglectus* is the female of a species of which the male is *Pseudogobiopsis römeri*. Later on in identifying specimens from the island Simalur, west of Sumatra, I found among the specimens from the same locality, that the males belonged to *P. römeri*, and the females to *S. neglectus*. So my opinion is now that the species has to bear the name *Stigmatogobius römeri* (M. Weber), as the name *Pseudogobiopsis römeri* has been used for the male, the name *Stigmatogobius neglectus* for the female.

4. **Stigmatogobius isognathus** Blkr.

Stigmatogobius isognathus Bleeker, Versl. Ak. Amsterdam (2) 12, 1878, p. 203.
Pseudogobius isognathus Koumans, Prel. Rev. Gobioid Fishes 1931, p. 102.
Stigmatogobius isognathus Koumans, Zool. Meded. Leiden 15, 1932, p. 6.

D. 1. VI; D. 2 I. 6; A. I. 6; P. 17; L.l. 25-26; L.tr. 7-8; Predorsal scales 7.

Body elongate, compressed, height 5 in length, $6^1/_4$ in total length. Head compressed, 4 in length, 5 in total length. Profile convex. Eye more than 3 in head, interorbital $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip before inferior margin of eye. Mouth a little oblique, jaws equal. Maxillary extends to below anterior margin of pupil. Teeth in front in several rows, laterally the number of rows decreases. Outer row a little enlarged. Inner row of lower jaw a little enlarged, no canines. Tongue rounded. A mucous canal runs longitudinally on cheek. Three short canals on opercle. No pore in interorbital. Open pore behind eye. Head scaled above behind eye and on opercle. Scales of head, neck, breast and belly cycloid, other scales ctenoid. Dorsal fins a little lower than body. Second and third rays of first dorsal fin are the longest. Pectoral fin obtusely rounded, a little longer than head. Ventral fin shorter than head. Caudal fin obtuse, shorter than head. Colour greenish above, lighter below. Laterally on body clouded with dark. First dorsal fin partly dark. Length 51 ? mm.

Habitat: Singapore; Java (Batavia!). — In sea and estuaries.

Types of *Stigmatogobius isognathus* seen in the Leiden Museum.

5. **Stigmatogobius oligactis** (Blkr.) (Fig. 27, p. 117)

Gobiopsis oligactis Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 113.
Glossogobius campbellianus Jordan & Seale, Proc. U.S. Nat. Mus. 33, 1908, p. 542, fig. 2.
Vaimosa siamensis Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 157, fig. 125.
Pseudogobiopsis oligactis Koumans, Zool. Meded. Leiden 18, 1935, p. 131, fig. 4. — Mem. Indian Mus. 13, 1941, p. 243.
Glossogobius campbellanus Koumans, Zool. Meded. Leiden 22, 1940, pp. 126, 146 (as synonym).
Vaimosa siamensis Koumans, o.c. p. 135 (as synonym).

D. 1 VI; D. 2 I. 6; A. I. 6; P. 18-19; L.l. 28; L.tr. 7-8; Predorsal scales 7-8.

Body elongate, anteriorly cylindrical, posteriorly compressed, height a little more than 4 in length, more than 5 in total length. Head depressed, profile convex, $3^1/_3$ in length, 4 in total length. Eye $4^1/_2$ in head, interorbital less than 1 eyediameter. Snout convex, shorter than eye, tip before lower part of eye. Jaws equal. Maxillary extends to posterior margin of preopercle. Teeth in front in several rows, laterally the number of rows decreases. In front in upper jaw outer row a little enlarged. Tongue bilobate. Head scaled above behind the eyes and laterally on opercle with large cycloid scales.

Scales of body ctenoid, except those before first dorsal fin and those on breast, which are cycloid. First dorsal fin pointed, much lower than body, first ray sometimes filiform. Second dorsal and anal fin higher than first dorsal fin. Pectoral fin rounded, not shorter than head without snout. Ventral fin a little shorter than pectoral fin, basal membrane weak. Caudal fin oblong. Colour reddish green to olive green above, lighter below. Each scale with a number of dark spots, placed in a transversal row. Head laterally with crowded blackish spots. First dorsal fin with dark spot at the top. Second dorsal and caudal fin with dark bands. Length 53 mm.

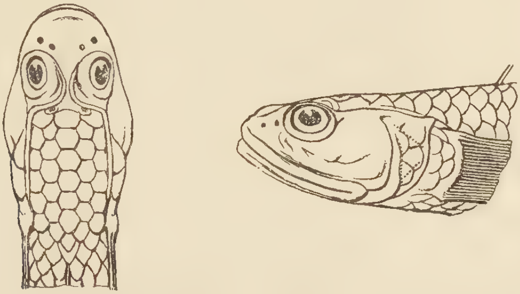

Fig. 27. *Stigmatogobius oligactis* (Blkr.). × 2. After Koumans.

Nom. indig.: Ikan gabus tomang.

Habitat: Java (Bogor!, Lake Grati = Lake Klindungan!); Ambon!. — India!, Siam!. — In sea and rivers.

Type of *Gobiopsis oligactis* seen in the Leiden Museum, type of *Glossogobius campbellianus* seen in U.S. Nat. Museum, paratype in Stanford University, specimens of *Vaimosa siamensis* seen in Acad. of Nat. Sci, Philadelphia.

6. **Stigmatogobius gastrospilos** (Blkr.)

Gobius gastrospilos Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 477.
Gobius gastrospilus Günther, Cat. Fishes 3, 1861, p. 43.
Stigmatogobius gastrospilus Bleeker, Versl. Ak. Amsterdam (2) 12, 1878, p. 206.
Stigmatogobius gastrospilus Koumans, Zool. Meded. Leiden 15, 1932, p. 8.

D. 1 VI; D. 2 I. 7; A. I. 7; P. 15; L.l. ± 26; L.tr. 7; Predorsal scales 7.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5 in length, more than 6 in total length. Head obtuse, convex, more than 4 in length, more than 5 in total length. Profile convex. Eye $3^1/_4$-$3^1/_2$ in head, interorbital $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip a little below inferior margin of eye. Lips thick, Mouth a little oblique, upper jaw prominent. Maxillary extends to below posterior margin of pupil. Teeth in upper jaw of outer row enlarged. In lower jaw inner row enlarged laterally. Longitudinal mucous canals on cheek. An open pore behind eye. Cheek and opercle scaled. Head scaled above behind eye. Scales of head, nape, breast and belly cycloid, on body ctenoid. First dorsal fin rounded, middle rays are the longest. Second dorsal fin a little higher than the first. Pectoral and ventral fin rounded, shorter than head. Caudal fin rounded, a little longer than head. Colour greenish above, lighter below. Scales of body with many minute dark spots. Behind ventral fin four oblong black spots. Ventral fin violet, other fins orange. First dorsal fin with blue spot posteriorly. Second dorsal, anal and caudal fin with spotted rays. Length 40 mm.

Habitat: Java (Djakarta!). — In sea.

Type seen in the Leiden Museum.

7. **Stigmatogobius mingi** (Herre)

Gnatholepis mingi Herre, Bull. Raffles Mus. 12, 1936, p. 8, pl. 4.
Gnatholepis mingi Koumans, Zool. Meded. Leiden 22, 1940, p. 151 (examination of type).

D. 1 VI; D. 2 I. 7; A. I. 7; L.l. 32; L.tr. 9; Predorsal scales 8-9.

Body elongate, compressed, height 3.65 in length. Head obtuse, 4 in length. Profile nearly straight. Eye 3 in head, interorbital broad. Snout obtuse, about $^1/_2$ eyediameter. Mouth a little oblique, upper jaw prominent. Maxillary extends to below anterior margin of pupil. Teeth small. Cheek and opercle scaled. Head scaled above behind the eye. Scales of head cycloid, of body ctenoid. First dorsal fin rounded, third ray is the longest. Second dorsal and anal fin higher than first dorsal fin. Pectoral and ventral fin rounded, shorter than head. Caudal fin rounded, about as long as head. Colour brown with a dark brown spot on each scale, except on belly. These spots form longitudinal rows. First dorsal fin with black blotch on basal half posteriorly, a white band above this blotch, margin black. Second dorsal and caudal fin with spotted rays. Other fins nearly colourless. Length 53 mm.

Habitat: Pulu Ubin near Singapore!.

Type seen in Stanford University.

8. **Stigmatogobius poicilosoma** (Blkr.)

Gobius poicilosoma Bleeker, Verh. Bat. Gen. 22, 1849, p. 31.
Gobius javanicus M. Weber, Zool. Ergebnisse 3, 1894, p. 412 (pro parte, not of Blkr.).
Gobius javanicus M. Weber in Semon, Zool. Forschungsreisen 5, 1895, p. 269 (not of Bleeker).
Gobius javanicus M. Weber, Nova Guinea 5, Zool. 2, 1908, p. 260 (not of Blkr.).
Gobius javanicus M. Weber & De Beaufort in Zool. Resultate, J. P. Kleiweg de Zwaan, Die Insel Nias 1915, p. 273 (not of Blkr.).
Mugilogobius galwayi McCulloch & Waite, Rec. South Austral. Mus. 1, 1, 1918, p. 50, pl. 3 fig. 1.
Mugilogobius galwayi Waite, o.c. 2, 1, 1921, p. 148, fig. 235.
Stigmatogobius poicilosoma Koumans, Zool. Meded. Leiden 15, 1932, p. 9. — Mem. Indian Mus. 13, 1941, p. 262.
Vaimosa serangoonensis Herre, Bull. Raffles Mus. 13, 1937, p. 40, pl. 2.
Vaimosa serangoonensis Koumans, Zool. Meded. Leiden 22, 1940, p. 153 (as synonym).
Mugilogobius galwayi Koumans, o.c. pp. 171, 172 (as synonym).

D. 1 VI; D. 2 I. 6-8; A. I. 6-8; P. 14; L.l. 26-29; L.tr. 7-8; Predorsal scales 7-9.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_2$-$5^1/_2$ in length, 6-7 in total length. Head obtuse, subcylindrical, 4-$4^1/_3$ in length, 5-$5^1/_2$ in total length. Profile convex. Eye 3 in head, interorbital $^1/_2$ eyediameter. Snout obtuse, shorter than eye, tip below inferior margin of eye. Mouth a little oblique, upper jaw prominent. Maxillary extends to beyond eye or not so far. Teeth in several rows in front, outer row a little enlarged. Inner row of lower jaw laterally a little enlarged. No canines. Tongue rounded. Head scaled above behind eye, opercle scaled. Scales of head cycloid, of body ctenoid. First dorsal fin pointed, anterior rays are the longest, second ray sometimes prolonged. Second dorsal and anal fin pointed. Pectoral fin obtuse. Pectoral and ventral fin about as long as head. Caudal fin obtuse, about as long as head. Colour greenish with dark spots in two alternating longitudinal rows of 4-5 spots. Two spots in a vertical line at the base of caudal fin. Head with indistinct dark streaks from eye to maxillary and behind mouth. First dorsal fin with dark longitudinal band halfway the fin, tip dark. Rays of second dorsal and caudal fin spotted. Length 65 mm.

Nom. indig.: Bloso (Jav.).

Habitat: Singapore Island (Serangoon!); Simalur (Kali Gunung Batu Sinabang!); Nias (Lahewa!); Java (Pasuruan!, Dirk de Vries bay!, Kali Sliling Idju Bagelen!); Bali (Boleleng!); Flores (river Nargi near Konga!); Ambon!; New Guinea (river Klipong!, river Mamapiri!). — India (South Salt Lake!, river Yenna!), Philippines (Taal Lake!), Australia (Lake Illawana!, Port Philippi near Melbourne!, Patawalunga Creek!, Noarlunga!). — In brackish water and rivers.

Type and paratype of *Vaimosa serangoonensis* seen in Stanford University, holotype and paratype of *Mugilogobius galwayi* seen in South Australian Museum, Adelaide, specimens of Bleeker's collection seen in the Leiden Museum.

9. **Stigmatogobius reticularis** (M. Weber)

Gobius reticularis M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 39, fig. 7.
Gobius reticularis De Beaufort, Bijdragen Dierkunde 1913, p. 140.
Gobius reticularis Fowler, Mem. B. P. Bishop Mus. 10, 1928, p. 405.

D 1 VI; D. 2 I. 7; A. I. 6; P. 15; L.l. 26; L.tr. 7; Predorsal scales 7.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-$5^2/_3$ in length, 6-$7^1/_3$ in total length. Head $3^3/_5$ in length, $4^2/_5$ in total length. Profile convex. Eye more than 3 in head, interorbital $^1/_2$ eyediameter. Snout shorter than eye, tip before lower half of eye. Mouth oblique, upper jaw a little prominent. Maxillary extends to below anterior margin of pupil. Teeth in some rows, outer a little enlarged. In lower jaw inner row laterally a little enlarged. Tongue truncate. Two short mucous canals longitudinally on cheek. Head scaled above behind eye and on opercle with cycloid scales. Base of pectoral fin and breast with cycloid scales. Scales of body ctenoid. First dorsal fin lower than body. Pectoral fin a little longer than head. Ventral fin a little shorter than head. Caudal fin oblong. Colour yellowish to brownish with dark markings placed in a network. Two dark spots in a vertical line at the base of caudal fin. Tip of first dorsal fin dark. Indistinct dark stripes halfway second dorsal fin. Length 22 mm.

Habitat: Aru Islands (Wokam!, Kobroor!); Waigeu (river Waiha!, river Rabiai!); Ceram (river Tubah!). — In rivers.

Type seen in the Amsterdam Museum.

Note: This species is close to, perhaps identical with *S. poicilosoma,* differing principally in colour.

10. **Stigmatogobius amblyrhynchus** Blkr.

Stigmatogobius amblyrhynchus Bleeker, Versl. Ak. Amsterdam (2) 12, 1878, p. 207.
Stigmatogobius amblyrhynchus Koumans, Zool. Meded. Leiden 15, 1932, p. 13.

D. 1 VI; D. 2 I. 7; A. I. 7; P. 14-15; L.l. 26; L.tr. 7; Predorsal scales 6-7.

Body elongate, anteriorly subcylindrical, posteriorly compressed, height $4^1/_3$-$4^1/_2$ in length, $5^1/_2$ in total length. Head 4 in length, 5 in total length. Profile convex. Eye 3-$3^1/_2$ in head, interorbital $^1/_3$-$^1/_2$ eyediameter. Snout obtuse, convex, shorter than eye, tip below inferior margin of eye. Lips thick. Mouth oblique, upper jaw prominent. Maxillary extends to below posterior part of eye. Teeth in lower jaw of inner row not enlarged, only a postsymphysial canine is present; other teeth small. Longitudinal mucous canals on cheek. Open pore behind eye at beginning of supraopercular groove. Head scaled above behind eye and on opercle. Scales of head, nape, breast and belly cycloid, other scales ctenoid. First dorsal fin pointed, about as high as body, second and third rays are the longest. Second dorsal and anal fin about as high as body, pointed posteriorly. Pectoral and ventral fin rounded, about as long as head. Colour green to olivous above, lighter below. Back and sides with irregular dark spots. Fins yellowish. First dorsal fin with two oblique black bars. Rays of second dorsal and caudal fin spotted. Ventral fin in centre violet. Length 45 mm.

Habitat: Java (Djakarta, Tjisekat). — In rivers and estuaries.

Types evidently lost, the description is made after BLEEKER.

11. **Stigmatogobius oyensi** (Bfrt.) (Fig. 28, p. 122)

Gobius oyensi De Beaufort, Bijdragen Dierkunde 1913, p. 137, fig. 4.

This species is very close to, probably identical with *S. amblyrhynchus*. The specimens differ from the description of that species as follows: D. 2 I. 7; A. I. 6-7; P. 14-17; Predorsal scales 7-8. Height of body 4 in length, 5-$5^{1}/_{2}$ in total length. Head $3^{1}/_{3}$-$3^{3}/_{4}$ in length. Eye 3-4 in head. Colour on sides brown blotches. Belly with three brown transversal bands. First dorsal fin with dark band and a black spot between third, fourth and fifth rays. Length 55 mm.

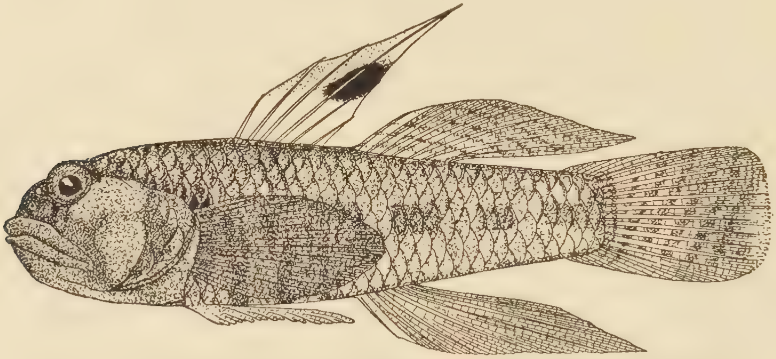

Fig. 28. *Stigmatogobius oyensi* (Bfrt.). × 1.8 After de Beaufort.

Habitat: Ceram (river Tubah!); Buru (Kajeli!); Babber (river Toilela!). — In rivers.

Types seen in the Amsterdam Museum.

12. **Stigmatogobius javanicus** (Blkr.)

Gobius javanicus Bleeker, Nat. Tijdschr. Ned. Indië 11, 1856, p. 88.
Gobius javanicus Günther, Cat. Fishes 3, 1861, p. 33.
Gobius melanosticta Day, Fishes India 1878, p. 290, pl. 63 fig. 2.
Gobius flavescens De Vis, Proc. Linn. Soc. N.S. Wales 9, 1884, p. 689 (not of Bloch).
?*Gobius johnstoniensis* De Vis M.S. in coll. Austral. Mus., Sydney.
Gobius melanostictus Day, Fauna Brit. India Fishes 2, 1889, p. 260.
Gobius javanicus M. Weber, Zool. Ergebnisse 3, 1894, p. 412 (pro parte) 1).
Vaimosa microstomia Seale, Philipp. Journ. Sci. § A 4, 1909, p. 538.
Gobius chilkensis Jenkins, Rec. Indian Mus. 5, 1910, p. 137, pl. 6 fig. 2.
Gobius javanicus M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 37 (not the synonym).

Gobius Rouxi M. Weber, o.c. p. 40, fig. 9.
Gobius javanicus M. Weber, Siboga Exp. Fische 1913, p. 456.
Gobius javanicus De Beaufort, Bijdragen Dierkunde 1913, p. 137.
(*Gobius*) *flavescens* McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 224, pl. 36 fig. 3 (not of Bloch).
Ctenogobius chilkensis Hora, Mem. Indian Mus. 5, 1923, p. 744.
Vaimosa microstomia Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 146.
Vaimosa piapensis Herre, o.c. p. 147, pl. 10 fig. 3.
Vaimosa tesselata Herre, o.c. p. 153, pl. 12 fig. 1.
Vaimosa javanica Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 408.
Gobius (*Pseudogobius*) *javanicus* Koumans, Zool. Meded. Leiden 13, 1930, p. 2.
Parvigobius immeritus Whitley, Australian Zoologist 6 pt. 2, 1930, p. 122 (substitute name for *G. flavescens* De Vis).
Parvigobius immeritus Whitley, Rec. Austral. Mus. 18, 1931, p. 122.
Stigmatogobius javanicus Koumans, Zool. Meded. Leiden 15, 1932, p. 11. — Mem. Indian Mus. 13, 1941, p. 263.
Gobius rouxi Koumans, o.c. 18, 1935, p. 142 (as synonym).
?*Gobius tessellata* Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 70.
Pseudogobius javanicus Aurich, Int. Revue Hydrobiol. u Hydrograph. 38, 1938, p. 160.
Gobius flavescens Koumans, Zool. Meded. Leiden 22, 1940, p. 161 (as synonym).
Gobius johnstoniensis Koumans, o.c. p. 166 (as probable synonym).
Vaimosa microstomia Koumans, o.c. p. 185 (as synonym).
Vaimosa piapensis Koumans, o.c. p. 185 (as synonym).[1]
Vaimosa tessellata Koumans, o.c. p. 185 (as synonym).

D. 1 VI; D. 2 I. 6-7; A. I. 6-7; P. 15; L.l. 25-27; L.tr. 7; Predorsal scales 6-8.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 4 in length, 5 in total length. Head subcylindrical, $4^{1}/_{4}$ in length, $5^{1}/_{4}$-$5^{1}/_{3}$ in total length. Profile convex. Eye about 3 in head, interorbital $^{1}/_{3}$ eyediameter. Snout obtuse, shorter than eye, tip before or a little below inferior margin of eye. Lips thin. Mouth a little oblique, upper jaw prominent. Maxillary extends to below anterior half of eye. Teeth in front in several rows, outer row a little enlarged. In lower jaw inner row not enlarged. No canines. Tongue rounded. Two mucous canals longitudinally on cheek. Some open pores round the eyes. Head scaled above behind eye and on opercle. Scales of head, breast and belly cycloid, laterally on body ctenoid. Middle rays of first dorsal fin are the longest. Second dorsal and anal fin higher than first dorsal fin. Pectoral fin and ventral fin about as long as head. Caudal fin obtuse. Colour greenish

---

1) The specimen mentioned from river Nargi near Konga river, Flores, belongs to S. *poicilosoma* (Blkr.).

above, reddish green below. Head with dark stripe from eye to maxillary and dark oblong spots on cheek. Body with numerous minute spots and laterally 2-3 longitudinal rows, each of 5 blotches. The blotches of the rows alternate. Below first dorsal fin a dark stripe obliquely forward. Two spots in a vertical line at base of caudal fin. First dorsal fin with dark spot between third and fifth ray. Rays of second dorsal and caudal fin spotted. Base of pectoral fin with two dark spots. Length 52 mm.

Nom. indig.: Njåhå (Jav.).

Habitat: Singapore; Pulu Ubin; Sumatra (Labuan Batu!); Java (near Djakarta!, Antjol!, Tandjong Priok!, Patjitan, Kali Sliling Idju Bagelen!, Surabaja!, Nusa Kambangan!); Lombok (Labuan Pandan!); Flores (Mbawa river near Reo!); Adonare (Badjo!); Borneo (Kumai river, Balikpapan bay!, Samarinda!, Kapuas river!); Celebes (Makassar!, river near Menado!, Balangnipa!, Paré Paré!); Sangir Islands (Peta); Buton (Bau bau river!); Obi major (Laiwui!); Buru (Kajeli); Ceram (Kairatu!, river Tubah!); Ambon (Ajer Larike!); Haruku (Wai Memi!); Aru Islands (Dobo! Waskeri river Wokam!, Enu!, Seltutti on Kobroor!); New Guinea (Japero at the mouth of Utakwa river!, Etna bay!, Hollandia Humboldt bay!). — India!, China!, ?Japan, Philippines!, Australia!, Tasmania!. — In sea, estuaries and rivers.

Types of *Gobius javanicus* seen in the Leiden Museum, specimen of *Gobius melanosticta* seen in the Leiden Museum, types of *Gobius rouxi* seen in the Amsterdam Museum, cotypes of *Gobius flavescens* De Vis, the types of *Parvigobius immeritus* Whitley, seen in Australian Museum, Sydney, cotype of *Vaimosa piapensis*, type of *V. microstomia* and type and cotypes of *V. tessellata* seen in Bureau of Science, Manila.

Note: Koumans, Zool. Meded. Leiden 22, 1940, p. 180 drew attention to the fact that this species probably hybridise with *Acentrogobius globiceps* (Hora).

13. **Stigmatogobius penango** (Popta)

Pseudogobius penango Popta, Zool. Meded. Leiden 7, 1922, p. 36.
Stigmatogobius penango Koumans, o.c. 15, 1932, p. 13.

D. 1 VI; D. 2 I. 6?; A. I. 6?; L.l. ± 26; L.tr. 7; Predorsal scales 10.

Body anteriorly subcylindrical, posteriorly compressed, height $4^1/_3$ to nearly 5 in length. Head subcylindrical, less than 3 to $3^1/_3$ in length. Eye 3-$3^1/_2$ in head, interorbital narrow. Snout shorter than eye. Mouth a little oblique, jaws subequal. Maxillary extends to below middle of eye. Teeth in several rows, outer row a little enlarged. Tongue truncate. Two mucous canals longitudinally on cheek. Scales of body weakly ctenoid to cycloid. Head scaled above behind eye and on opercle. Colour violet brownish, each scale with a dark margin. Length without caudal fin 31 mm.

Habitat: Celebes (Penango, Rumbia!).

Type seen in the Leiden Museum.

14. **Stigmatogobius hoevenii** (Blkr.)

Gobius Hoevenii Bleeker, Nat. Tijdschr. Ned. Indië 2, 1851, p. 426.
Gobius hoevenii Günther, Cat. Fishes 3, 1861, p. 32.
?*Gobius notospilus* Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 173, pl. 109 fig. B.
Gobius (*Hoeveni Blkr.*?) M. Weber, Nova Guinea 5, Zool. 2, 1908, p. 260.
Gobius hoevenii Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 404.
Stigmatogobius hoeveni Koumans, Zool. Meded. Leiden 15, 1932, p. 11.
Vaimosa chulae H. M. Smith, Journ. Siam Soc. Nat. Hist. Suppl. 8 no. 4, 1932, p. 260, pl. 23 fig.
Tamanka sinensis Herre, Hongkong Naturalist 6 no. 3 and 4, 1935, p. 288.
Vaimosa zebra Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 171, fig. 23.
Vaimosa hoeveni Herre, Rec. Indian Mus. 41 pt. 4, 1939, p. 348.
Tamanka sinensis Koumans, Zool. Meded. Leiden 22, 1940, p. 149 (as synonym).
?*Vaimosa fusca* Herre, Philipp. Journ. Sci. 72 no. 4, 1940, p. 359, pl. 3.
Stigmatogobius hoevenii Koumans, Mem. Indian Mus. 13, 1941, p. 260.

D. 1 VI; D. 2 I. 7-8; A. I. 7-8; P. 16; L.l. 28-32; L.tr. 8-10; Predorsal scales 11-13.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 4 in length, 5 in total length. Head depressed, $3^1/_2$ in length, $4^1/_2$ in total length. Profile convex. Eye $3^1/_2$ in head, interorbital more than 1 eyediameter. Snout obtuse, shorter than eye, tip before or below lower margin of eye. Mouth a little oblique, upper jaw prominent. Maxillary extends to below posterior part of eye or not so far. Teeth in several rows; in lower jaw laterally inner row enlarged. Tongue rounded. Longitudinal mucous canals on cheek. A row of 4 open pores on each side in interorbital space above and behind the eye. Head scaled above behind eye and on opercle with cycloid scales. Scales of nape and breast cycloid, other scales ctenoid. First dorsal fin much lower than body, middle rays are the longest, sometimes filiform. Second dorsal and anal fin lower than body. Pectoral fin rounded, about as long as head. Ventral fin shorter than head. Caudal fin obtuse, about as long as head. Colour yellowish brown. Nape with a dark stripe from nape to upper end of base of pectoral fin, followed by some shorter ones parallel to it, to before first dorsal fin. These stripes run obliquely downward and backward. Under first dorsal fin an oblique dark stripe, running downward and forward, ending behind pectoral fin. Behind this stripe a number (about 6) of dark transversal stripes on back. Each scale has a dark margin, which form a network of oblique dark stripes on body. Before the beginning of caudal rays two dark spots, placed in a vertical line. First dorsal fin with dark blotch halfway the fin, margin diaphanous. Length 60 mm.

Nom. indig.: Ikan Belontok (Singapore).

Habitat: Singapore!; Ayer Merbau Island!; Nias (Lahewa!, West Nias!); Krakatau (Verlaten Island!); Java (Djakarta market!, fishponds near Djakarta!, Bay of Djakarta!, Dirk de Vries bay!); Borneo (river Sambas!); Celebes (Boloang); Talaud Islands (Beo!); Aru Islands (Dobo!, Seltutti on Kobroor!); New Guinea (Trambuai!, Japero at the mouth of Utakwa river!). — Andamans, Siam!, Hongkong!, ?Philippines, Samoa!, Viti Levu!. — In sea, estuaries and freshwater.

Type of *Gobius hoevenii* seen in the Leiden Museum, type of *Gobius notospilus* seen in British Museum (N.H.), type of *Tamanka sinensis* seen in Stanford University.

Note: A male specimen of 46 mm and a female of 40 mm, ready to spawn, both from localities in the Indo-Australian Archipelago, differ in colour from the description given above. The body is grayish. Head with numerous small black spots. Upper lip black. Each scale of body has a short black longitudinal stripe, which forms with the other stripes dark longitudinal stripes on neck and body. Two black spots in a vertical line at the base of caudal fin. All fins dark, except the ventral fin, which has only the central part dusky.

15. **Stigmatogobius borneensis** (Blkr.)

Gobius borneensis Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, p. 10.
Gobius borneensis Günther, Cat. Fishes 3, 1861, p. 33.
Stigmatogobius singapurensis Bleeker, Versl. Ak. Amsterdam (2) 12, 1878, p. 204.
Stigmatogobius borneensis Koumans, Zool. Meded. Leiden 15, 1932, p. 7.

D. 1 VI; D. 2 I. 7; A. I. 8; P. 14-17; L.l. 28-30; L.tr. 8-9; Predorsal scales 13-14.

Body subelongate to elongate, compressed, height 4-4$^1/_3$ in length, 5-5$^1/_2$ in total length. Head compressed, 3$^1/_2$-3$^2/_3$ in length, 4$^1/_2$-5 in total length. Profile a little convex. Eye 3-4$^1/_2$ in head, interorbital 1-1$^1/_2$ eyediameter. Snout very obtuse, shorter than eye, tip before middle of eye. Mouth a little oblique, lower jaw prominent. Maxillary extends to below anterior, or to below posterior half of eye. Teeth in several rows, small, outer row a little enlarged. In lower jaw outer row extends to halfway the jaw; teeth of inner row laterally a little enlarged, no canines. Tongue rounded. A number of mucous canals radiate under eye. No pore in interorbital, no pore behind eye. Head scaled above behind eye and on opercle with large cycloid scales. Scales of nape, breast and belly cycloid, other scales ctenoid. First dorsal fin lower than body, second and third rays are the longest. Second dorsal fin higher than the first, but lower than body. Anal fin similar to second dorsal fin. Pectoral fin obtuse, shorter than head. Ventral fin a little longer than pectoral fin. Caudal fin obtusely rounded, about as long as head. Colour dark green to violet above, lighter below. A dark stripe from eye to behind maxillary. Laterally the body is dark spotted. A dark transverse stripe at the insertion of first dorsal fin, this stripe ends in a spot behind the pectoral fin. Fins yellowish. First dorsal fin with dark spot at the base between third and sixth ray. Rays of second dorsal, caudal and anal fin dark spotted. Second dorsal, anal and caudal fin with dark longitudinal stripes. Dark spot at the base of caudal fin. Length 70 mm.

Habitat: Singapore!; Sumatra (Palembang); Borneo (Bandjermasin, Gunung Ambawang!). — In rivers and brackish water.

Specimens of *Gobius borneensis* and type of *Stigmatogobius singapurensis* seen in the Leiden Museum.

20. **Illana** Smith & Seale

(Smith & Seale, Proc. Biol. Soc. Washington 19, 1906, p. 79)

Body elongate, compressed, covered with 30-32 scales. Head a little depressed, naked. Interorbital less than eyediameter. Lower jaw a little prominent. Teeth in upper jaw in a row of large, stout teeth, followed by three rows of minute, depressible teeth. In lower jaw outer row smaller than in upper jaw, followed by two rows of minute depressible teeth. No canines. Tongue deeply emarginate. Five to six longitudinal and two oblique mucous canals on cheek. On each side of chin a barbel. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 9; A. I. 8. Ventral fins united. Caudal fin rounded.

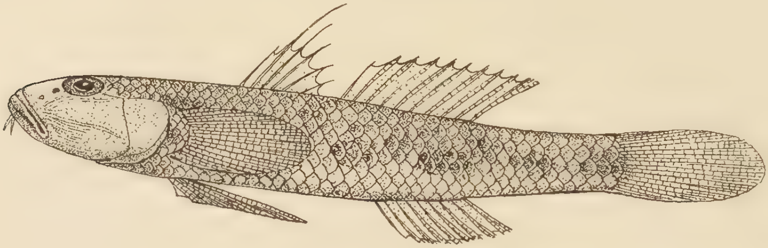

Fig. 29. *Illana bicirrhosus* (M. Weber). × $1^1/_3$.

Distribution: Indo-Australian Archipelago, Philippines.

1. **Illana bicirrhosus** (M. Weber) (Fig. 29, p. 128)

Gobius bicirrhosus M. Weber, Zool. Ergebnisse 3, 1894, p. 412.
Illana cacabet Smith & Seale, Proc. Biol. Soc. Washington 19, 1906, p. 80, fig.
Illana cacabet Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 269, pl. 21, fig. 3.
Illana bicirrhosus Koumans, Zool. Meded. Leiden 18, 1935, p. 143.
Illana cacabet Koumans, o.c. 22, 1940, pp. 129, 191 (as synonym).
Illana bicirrhosa Herre, Proc. Biol. Soc. Washington 57, 1944, p. 7.

D. 1 VI; D. 2 I. 9; A. I. 8; P. 18-19; L.l. 30-32; L.tr. 9; Predorsal scales 13-15.

Body elongate, compressed, height 6 in length. Head $3^1/_2$-$3^3/_4$ in length. Profile a little convex. Eye $3^3/_4$-4 in head, interorbital less than $^1/_2$ eyediameter. Snout blunt, about as long as eye, tip before lower half of eye. Mouth a little oblique, lower jaw prominent. Maxillary extends to below the anterior border of eye or not so far. Teeth in upper jaw in some rows, outer and inner row enlarged. In lower jaw outer row enlarged, laterally inner row enlarged. Tongue deeply emarginate. Five to six longitudinal and two oblique mucous canals on cheek. Two barbels under chin. Head naked above behind the eyes, rest of head naked. Scales of body ctenoid, scales of breast cycloid. First dorsal fin about as high as body, second ray is the longest. Second dorsal and anal fin lower than body. Caudal fin oblong, about as long as head. Pectoral and ventral fin a little shorter than head. Colour in spirits yellowish brown with four indistinct bands over back, the first before first dorsal fin, second on the place of insertion of first dorsal fin, third at the insertion of second dorsal fin, fourth just behind second dorsal fin. Along the side a longitudinal row of five dark blotches, alternating with the indistinct bands on the back. Cheek clouded with dark. Dorsal fin with oblique lines of dark dots. Caudal fin with vertical brown bands. Length 85 mm.

Habitat: Java (Besoeki!); Celebes (Moros river!). — Philippines (Rio Grande in Mindanao!, Ganay, Dumaguete). — In freshwater.

Types of *Gobius bicirrhosus* seen in the Amsterdam Museum, cotype in the Leiden Museum, type of *Illana cacabet* seen in U.S. Nat. Museum.

21. **Quisquilius** Jordan & Evermann

(Jordan & Evermann, Bull. U.S. Fish Comm. 22 (1902) 1904, p. 203)

Cingulogobius Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 201.

Body elongate, compressed, covered with 25-32 ctenoid scales.

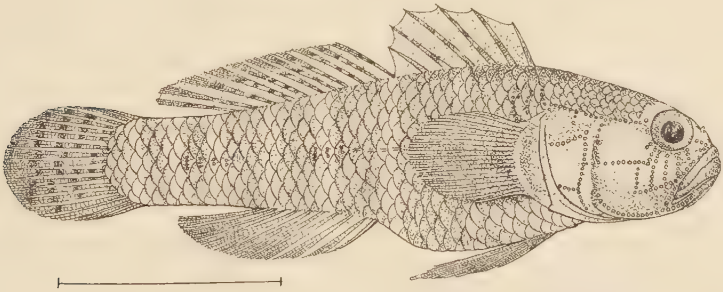

Fig. 30. *Quisquilius eugenius* Jordan & Evermann. × 3.

Head a little compressed to depressed, scaled above behind the eyes, cheek and opercle more or less scaled (to naked?). Eye large, interorbital $^1/_2$ eyediameter. Snout shorter than eye. Anterior nostril in a small tube. Mouth oblique, lower jaw prominent. Teeth apparently in two rows, but placed in many rows of very small ones, outer row enlarged, inner row a little enlarged. Tongue truncate to very slightly bilobate. Some fringed mucous canals on cheek, some short canals on opercle. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 I. 8-11; A. I. 8-9. Ventral fins joined at the base of inner rays by a narrow membrane. Pectoral fin without free silklike rays. Caudal fin rounded.

Distribution: India, Japan to the Pacific.

Key to the Indo-Australian species of Quisquilius

1. D. 2 I. 10-11; A. I. 8-9; L.l. ± 30; L.tr. ± 10; Predorsal scales ± 16. . . . . . . 1. *Q. eugenius* p. 130.
2. D. 2 I. 9; A. I. 9; L.l. 28-30; L.tr. 7; Predorsal scales 8. Body with cross bars . . 2. *Q. malayanus* p. 132.
3. D. 2 I. 8; A. I. 8; L.l. 26-28; L.tr. 8-9; Predorsal scales 9. Body without cross bars. 3. *Q. macrophthalmus* p. 132.

1. **Quisquilius eugenius** Jordan & Evermann (Fig. 30, p. 129)

Quisquilius eugenius Jordan & Evermann, Bull. U.S. Fish Comm. 22, (1902) 1904, p. 203.

Gobiomorphus cinctus Regan, Trans. Linn. Soc. London 12 pt. 3 Zool, 1908, p. 240.

Amblygobius naraharae Snyder, Proc. U.S. Nat. Mus. 35, 1908, p. 101. — o.c. 42, 1912, pl. 68 fig. 2.

Pleurogobius boulengeri Seale, Philipp. Journ. Sci. § A 4, 1909, p. 536.

Quisquilius profundus M. Weber, Notes Leyden Mus. 31, 1909, p. 155. — Siboga Exp. Fische 1913, p. 483, fig. 100.

Cingulogobius boulengeri Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 201, pl. 16 fig. 1.

Gobiomorphus eugenius Fowler, Mem. B.P Bishop Mus. 10, 1928, p. 393.

Quisquilius profundus Koumans, Zool. Meded. Leiden 15, 1932, p. 14.

Cingulogobius naraharae Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 371, fig. 26.

Gobius eugenius Tomiyama Jap. Journ. Zool. 7 no. 1, 1936, p. 61, fig. 14.

Amblygobius naraharae Koumans, Zool. Meded. Leiden 22, 1940, pp. 127, 145 (as synonym).

Quisquilius eugenius Koumans, o.c. p. 133 (as synonym). — Mem. Indian Mus. 13, 1941, p. 248.

Cingulogobius boulengeri Koumans, o.c. p. 156 (as synonym).

Pleurogobius naraharae Schultz, Bull. 180 U.S. Nat. Mus. 1943, p. 228, 239.

D. 1 VI; D. 2 I. 10-11; A. I. 8-9; P. 18-19; L.l. ± 30; L.tr. ± 10; Predorsal scales ± 16.

Body elongate, compressed, height $3^3/_4$ in length. Head compressed, $3^1/_2$ in length. Eye $3^1/_4$ in head, interorbital very narrow. Anterior nostril tubular. Mouth oblique, lower jaw prominent. Maxillary extends to below anterior margin of pupil. Teeth apparently in two rows, but placed in many rows, outer row enlarged, inner row a little enlarged; laterally in lower jaw a canine. Tongue truncate to slightly bilobate. Gillopenings continued forward below, isthmus narrow. Some mucous canals radiate under eye, crossed by two longitudinal ones. In interorbital some short canals. Scales of body ctenoid, on breast cycloid. Head scaled above behind eye, cheek naked, opercle naked or with a few scales along upper margin. Dorsal fins close together. First dorsal fin lower than body, middle rays are the longest. Caudal fin oblong, shorter than head. Pectoral fin as long as head. Ventral fins united, but membrane often torn, basal membrane absent. Colour yellowish. Head and body are dotted with small black spots. There are 12 transversal light bands on body, the foremost four on head, fifth just before first dorsal fin, sixth from middle of first dorsal fin, seventh at beginning of second dorsal fin, eighth and ninth below second dorsal fin, tenth, eleventh and twelfth on caudal peduncle. Of these bands the sixth, eighth and ninth are extending upward on dorsal fins. Dorsal fins and caudal fin with minute spots, other fins immaculate. Length 50 mm.

Habitat: Northwest Sumatra (East of Segli!); Strait Malakka (Aru bay on 4° 32′ N, 98° 23′ E!, 6° 00′ N, 98° 99′ E at 60 fathoms!); Nias (Telak Dalem!); Sumbawa (Sapeh Strait at 70 m!); Sulu Islands (Sitankai); Celebes (Lembeh Strait!, Palos bay near Dongala at 36 m!). — India!, Chagos Archipelago!, Japan!, Philippines, Solomon Islands, Marquesas Islands, Honolulu!, Phoenix Isl. Tonga Isl. — In sea, sometimes at some depth.

Type of *Quisquilius profundus* seen in the Amsterdam Museum, type of *Amblygobius naraharae* seen in U.S. Nat. Museum, cotypes seen in Stanford University, specimens of *Quisquilius eugenius* seen from the collection of U.S. Bureau of Fisheries.

Note: This species is very similar to *Zonogobius semidoliatus* (C.V.), but differs, besides in other characters, in having the head scaled above behind eyes to first dorsal fin with about 16 ctenoid scales, while in *Zonogobius* this region is naked. Both species occur in the Indo-Australian region.

2. **Quisquilius malayanus** Herre

Quisquilius malayanus Herre, Bull. Raffles Mus. 12, 1936, p. 11, pl. 8.
Quisquilius malayanus Koumans, Zool. Meded. Leiden 22, 1940, p. 152.

D. 1 VI; D. 2 I. 9; A. I. 9; L.l. 28-30; L.tr. 7; Predorsal scales 8.

Height of body 3.44 in length. Head 3.44 in length. Eye 2.57 in head, interorbital very narrow. Snout 4.5 in head. Mouth oblique. Maxillary extends to below anterior margin of eye. Teeth minute, except an enlarged anterior tooth on each side above and below. Two longitudinal rows of mucous canals on cheek, crossed by short canals which radiate from below eye, one row along posterior margin of preopercle. Head scaled above from behind the eye, rest of head naked. Scales ctenoid, becoming cycloid before first dorsal fin. First dorsal fin lower than body, third ray is the longest. Pectoral fin pointed, about as long as head. Ventral fin a little shorter, basal membrane well developed. Caudal fin pointed, but as long as head. Colour brownish, with darker cross bands, the first on nape, the last on caudal peduncle. A dark blotch on base of caudal fin. First dorsal fin with blackish oblong blotch above between first and third ray. An oblique blackish brown stripe on upper part of caudal fin, with a white bar above and below it. Ventral fin dusky in central part, other fins pale clear brown. Length 39 mm.

Habitat: Pulu Ubin near Singapore!.

Type and paratypes seen in Stanford University.

3. **Quisquilius macrophthalmus** M. Weber (Fig. 31, p. 133)

Quisquilius macrophthalmus M. Weber, Notes Leyden Mus. 31, 1909, p. 156. — Siboga Exp. Fische 1913, p. 483, fig. 101.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 14; L.l. 26-28; L.tr. 8-9; Predorsal scales 9.

Body a little compressed, height $4^1/_2$ in length. Head a little depressed, 3 in length, $3^1/_2$ in total length. Eye $2^1/_2$ in head, interorbital very narrow. Snout much shorter than eye. Mouth a little oblique, lower jaw prominent. Maxillary extends to below middle of eye. Lips thick. Teeth in several rows, outer row enlarged, caninoid, inner row a little enlarged. Gillopenings not continued forward below, isthmus moderate. Three longitudinal rows of mucous canals on cheek, one row along posterior margin of preopercle. Head scaled above from a little behind the eyes. Scales ctenoid, becoming cycloid before first dorsal fin. Middle rays of first dorsal fin are the longest. Caudal fin oblong. Basal membrane of ventral fin very narrow. Colour yellowish, back below second dorsal fin and before caudal fin brownish. Back below first dorsal fin and head brown. First and second dorsal fins with weakly developed bands. Length 30 mm.

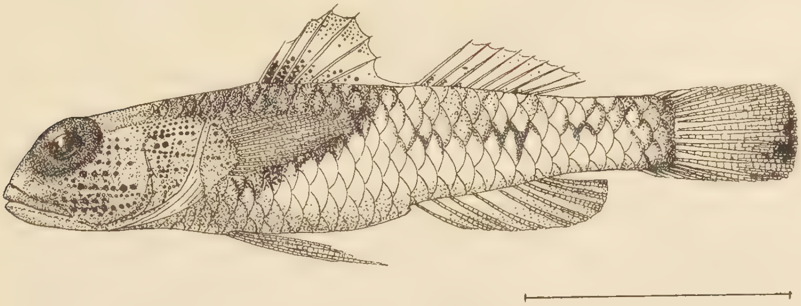

Fig. 31. *Quisquilius macrophthalmus* M. Weber. × 3.5.

Habitat: Djampea!.

Type seen in the Amsterdam Museum.

22. **Pandaka** Herre

(Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 196)

Body elongate, compressed, covered with 22-24 ctenoid scales. Neck naked before first dorsal fin, breast naked. Head subcylindrical, naked. Interorbital about 1 eyediameter. Mouth oblique, lower jaw prominent. Teeth in upper jaw in 2-3 rows, outer row enlarged. In lower jaw in 2 rows. Gillopenings restricted, isthmus broad. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 6-7; A. I. 5-6. Caudal fin oblong to obtuse.

Distribution: Sulu Islands, Philippines.

Key to the Indo-Australian species of Pandaka

1. First rays of first dorsal fin prolonged, especially in male specimens, longer than height of body, which is 3.6-4.1 in length . . . . 1. *P. pusilla* p. 134.

2. First rays of first dorsal fin not prolonged, shorter than height of body, which is 4-4.8 in length in females, 5-5.6 in males . . . . *2. P. pygmaea* p. 135.

1. **Pandaka pusilla** Herre

Pandaka pusilla Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 197, pl. 15 figs. 1 and 2.
Pandaka pusilla Koumans, Zool. Meded. Leiden 22, 1940, p. 187.

D. 1 VI; D. 2 I. 6; A. I. 6; L.l. 22-24; L.tr. 7-8.

Body strongly compressed posteriorly, height 3.6-4.1 in length. Head 3.1-3.5 in length. Eye 3-3.3 in head, interorbital about 1 eye-diameter. Snout a little shorter than eye, tip before lower half of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below anterior third of eye. Teeth in upper jaw in three rows, outer row enlarged. In lower jaw 2 rows of teeth. Head and nape naked to first dorsal fin. Body with ctenoid scales. The first, or first and second rays of first dorsal fin are, especially in the male, prolonged beyond the membrane, longer than height of body. Second dorsal and anal fin lower than body. Caudal fin obtuse, shorter than head. Pectoral fin rounded, shorter than head. Ventral fin elongate. Colour yellowish brown with minute blackish dots over entire body. A larger red brown quadrangular spot between and behind the eyes. A black spot at base of caudal fin. A smaller black spot at base of anal fin, and two at ventral side of caudal peduncle. In male a black blotch on membrane between fifth and sixth ray of first dorsal fin. A black spot at upper part of base of pectoral fin. Dorsal fins and anal fin with minute brown dots. Length 18 mm.

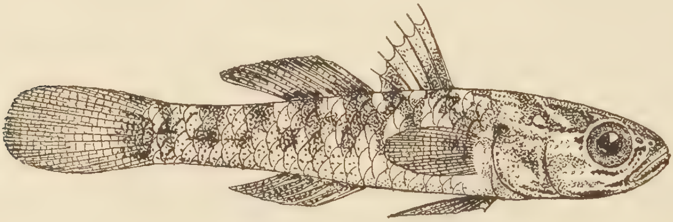

Fig. 32. *Pandaka pygmaea* Herre. × 8.

Habitat: Sulu Islands (Sitankai!). — Philippines (Busuanga, Panay).

Types seen in Bureau of Science, Manila.

2. **Pandaka pygmaea** Herre (Fig. 32, p. 134)

Pandaka pygmaea Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 198, pl. 15 fig. 3. — Science 69, 1929, p. 329.
Pandaka pygmaea Koumans, Zool. Meded. Leiden 22, 1940, p. 187.

D. 1 VI; D. 2 I. 6-7; A. I. 5; L.l. 22; L.tr. 6.

Body elongate, posteriorly compressed, height of females 4-4.8 in length, of males 5-5.6 in length. Head depressed, 3-3$^1/_3$ in length. Eye 2$^1/_2$-3$^1/_5$ in head, interorbital about 1 eyediameter. Snout very short, less than $^1/_2$ of eye, tip before middle of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below middle of eye or not so far. Two rows of teeth in each jaw. In upper jaw outer row enlarged and widely spaced, inner row minute. Head and nape naked to first dorsal fin. Rest of body with ctenoid scales. Dorsal fins and anal fin low. Caudal fin obtuse, shorter than head. Colour yellowish with a number of dark spots along the side, alternating with a row of similar spots along the back. Head and belly with small black spots. A black spot in middle of base of caudal fin. A small spot at upper part of base of pectoral fin. Length 11 mm.

Habitat: Sulu Islands (Jolo Timpuke Lake!). — Philippines (Luzon).

Types seen in Bureau of Science, Manila.

Note: Herre described the species after specimens probably from Malabon. The specimens, which I have seen, agree with Herre's description.

23. **Amblygobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 322)
Odontogobius Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 323.

Body elongate, compressed, covered with 50-75 scales, ctenoid on the most parts of body, becoming cycloid on nape, breast and belly. Head compressed, scaled above behind the eyes and on upper part of opercle. Bony interorbital about $^1/_2$-1 eyediameter. Snout blunt, about as long as eye. Nostrils not tubular or anterior one in a very short tube. Mouth a little oblique, jaws subequal or lower jaw a little prominent. Teeth in both jaws in 2-3 rows, the outer strongly enlarged; the outer row of lower jaw extends to halfway the jaw, last teeth are recurved canines. Tongue truncate. Two mucous canals on cheek, diverging posteriorly. Some open pores on head. Gillopenings not very wide, isthmus broad. Inner edge of shoulder-girdle without fleshy flaps. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 I. 13-16; A. I. 13-16. Ventral fins united, oblong, basal membrane weakly developed. Pectoral fin without free silklike rays, base scaled. Caudal fin rounded.

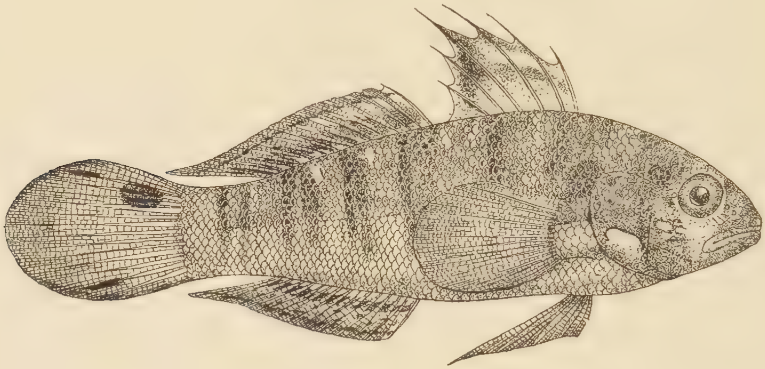

Fig. 33. *Amblygobius albimaculatus* (Rüpp.). n.s.

Distribution: Red Sea to the Pacific.

Key to the Indo-Australian species of Amblygobius

1. Body with longitudinal bands (at least anteriorly on body), no transversal bands.
   A. One longitudinal band from eye to beneath origin of first dorsal fin . . . . 1. *A. inornatus* p. 137.
   B. Two or three longitudinal bands on body.
      a. 55-65 scales in L.l. No ocelli on nape.
         a'. Some crossbands over back . . . . 2. *A. decussatus* p. 137.
         b'. No crossbands . . . . 3. *A. linki* p. 139.
      b. 70-75 scales in L.l. Some ocelli on nape. 4. *A. bynoensis* p. 139.
2. Body with transversal bands. L.l. 50-55.
   A. About 30 predorsal scales. Maxillary extends to below anterior half of eye. No streak on branchial membrane . . . . 5. *A. albimaculatus* p. 141.
   B. About 20 predorsal scales. Maxillary extends to below middle of eye or farther back. Branchial membrane with dark streak. . . 6. *A. sphynx* p. 143.

1. **Amblygobius inornatus** Herre

Amblygobius inornatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 228.
Amblygobius inornatus Koumans, Zool. Meded. Leiden 22, 1940, p. 189.

D. 1 VI; D. 2 I. 11; A. I. 10; L.l. 68.

Body elongate, height 6.45 in length. Head subcylindrical, 3.4 in length. Eye 4.09 in head, interorbital very narrow. Snout blunt, a little shorter than eye, 4.5 in head. Mouth oblique, lower jaw a little prominent. Maxillary extends to beneath front margin of pupil. Teeth in upper jaw in 3 rows, outer row enlarged. In lower jaw teeth in 4 rows, outer row enlarged, extending to halfway the jaw, last tooth is a curved canine; the middle rows of teeth in lower jaw are minute, the inner row is a little enlarged. Scales ctenoid, their teeth are minute and very fragile. Head and nape naked. Caudal fin subtruncate, 3.875 in length, $1^1/_8$ in head. Pectoral and ventral fin pointed, 1.5 in head. Colour after Herre "in alcohol uniform brown with an inconspicuous, wide, dark brown band passing back from eye along upper part of side and disappearing beneath origin of second dorsal; the first dorsal light brown basally, above this a wide, clear, horizontal band, the remainder of the fin blackish brown; the second dorsal dark brown, vaguely crossbarred by two rows of pale spots; the caudal light brown, with crossbars of blackish brown; the anal light brown with a blackish margin; the pectorals are the color of body; the ventrals brown, the middle blackish brown." Length 37 mm.

Habitat: Sulu Islands (Siasi at Martin Ranch!). — In a tide pool.

Type seen in Bureau of Science, Manila. It is in a bad state, so that the characters are not distinct now.

Note: With some hesitation we place this species in *Amblygobius,* as the nape is described to be naked.

2. **Amblygobius decussatus** (Blkr.)

Gobius decussatus Bleeker, Nat. Tijdschr. Ned. Indië 8, 1855, p. 442.
Gobius decussatus Günther, Cat. Fishes 3, 1861, p. 69.
Rhinogobius perpusillus Seale, Philipp. Journ. Sci. § A 4, 1909, p. 534.
Amblygobius perpusillus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 229.
Amblygobius perpusillus buanensis Herre, o.c. p. 230, pl. 18 fig. 2.
Amblygobius decussatus Koumans, Zool. Meded. Leiden 18, 1935, p. 139.
Amblygobius perpusillus Koumans, o.c. 22, 1940, pp. 153, 189 (as synonym).

D. 1 VI; D. 2 I. 13-15; A. I. 13; L.l. 60-65; L.tr. 18; Predorsal scales 28.

Body elongate, compressed, height $4^1/_2$ in length, $5^1/_2$ in total length. Head compressed, 4 in length, 5 in total length, profile convex. Eye 3-$3^1/_2$ in head, interorbital about $^1/_2$ eyediameter. Snout obtuse, a little shorter than eye, tip a little below inferior margin of eye. Anterior nostril in a short tube. Jaws equal. Maxillary extends to below anterior half of eye. Teeth in upper jaw in 3 rows, outer enlarged, 4-5 caninoid teeth on each side. In lower jaw teeth in 2 rows, outer enlarged, composed of 6 teeth, the last one is a curved canine. Two open pores in median line in interorbital space. An open pore behind eye at the beginning of supraopercular groove. A row of 3 open pores along posterior margin of preopercle. Head scaled above behind eyes and on upper part of opercle with cycloid scales. Scales of nape, breast and belly cycloid, other scales ctenoid. Dorsal fins with the bases subcontinuous. First dorsal fin half of height of body, middle rays are the longest. Second dorsal and anal fin not much higher than first dorsal fin, pointed posteriorly. Pectoral fin obtusely rounded, not longer than head. Ventral fin obtuse, not longer than head without snout, basal membrane very low. Caudal fin obtuse, a little longer than head. Colour of upper parts greenish red, lower parts pearl coloured. Head laterally with 2 red streaks, bordered with black or blue, upper one from snout through eye to supraopercular groove, lower one from chin to behind maxillary and opercle to base of pectoral fin. Head and breast with numerous small blue spots. On upper part of body 4 red to dark orange longitudinal streaks, crossed by 10-12 transversal streaks of the same colour. Upper part of caudal fin with orange ocellus, bordered by blue. Dorsal fins and anal fin orange with many blue streaks, which are a little obliquely placed. Pectoral fin violet, base orange. Ventral fin orange. Caudal fin orange, bordered with blue. Length 75 mm.

Habitat: Nias; Sulu Islands (Buan Island near Tawi tawi!); Celebes (Menado); Buru (Kajeli); Waigeu!. — Philippines, Pelew Islands. — In sea and estuaries.

Type of *Gobius decussatus* seen in the Leiden Museum, type of *Amblygobius perpusillus buanensis* seen in Bureau of Science, Manila.

3. **Amblygobius linki** Herre

Apocryptes lineatus M. Weber, Siboga Exp. Fische 1913, p. 484 (not of Alleyne & Macleay).
Amblygobius linki Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 231, pl. 18 fig. 4.
Amblygobius linki Koumans, Zool. Meded. Leiden 22, 1940, pp. 153, 189.

D. 1 VI; D. 2 I. 13; A. I. 12; L.l. 60; L.tr. 16; Predorsal scales 24—± 30.

Body wedge-shaped, height $4^3/_4$ in length, 6 in total length. Head $3^3/_4$ in length, 5 in total length. Eye and snout 3.5 in head. Snout blunt, convex, tip before lower margin of eye. Interorbital $^3/_4$ eye-diameter. Mouth oblique, maxillary extends to below middle of eye. Scales of body ctenoid posteriorly, cycloid anteriorly. Head scaled above behind eye. Opercle scaled along upper margin. Pectoral fin as long as head. Ventral fin shorter than head. Caudal fin a little longer than head. Colour after Herre "in alcohol uniform reddish brown with three chocolate brown longitudinal stripes on each side; the first extends from above front of eye back on side of nape to fourth or fifth ray of second dorsal and is then continued on fin as a basal bar; the second passes around snout on upper lip, through eye, and continues back with a slight upward slant to top of caudal peduncle and on to upper part of caudal fin; the third passes around chin to corner of mouth, slants upward across cheek to base of pectoral where it apparently ends in a large spot, but continues on from axil of pectoral as a broad lateral stripe to base of caudal; a diagonal dark stripe on lower part of caudal; the cheek band bordered above and below by rows of large and more or less circular pearly spots; a dark blotch between tips of fourth and fifth dorsal spines." Length 77 mm.

Habitat: Borneo (Sandakan!); Sulu Islands (Bungau!); Siau Islands!; Waigeu!. — Mindanao (Caldera bay!).

Type of *Amblygobius linki* seen in Bureau of Science, Manila.

4. **Amblygobius bynoensis** (Rich.)

Gobius labroides v. Hasselt (M.S.).
Gobius bynoensis Richardson, Voy Erebus & Terror Fishes 1844, p. 1, pl. 1 figs. 1 and 2.
Gobius stethophthalmus Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, p. 248, fig. 7.
Gobius bynoensis Günther, Cat. Fishes 3, 1861, p. 70.

Gobius bynoensis Steindachner, Sitz. ber. Ak. Wiss. Wien 56, 1867, p. 314. — o.c. 60, 1870, p. 563.
Apocryptes lineatus Alleyne & Macleay, Proc. Linn. Soc. N.S. Wales 1, 1877, p. 332, pl. 12 fig. 3.
Apocryptes bivittatus Macleay, o.c. 2, 1878, p. 357, pl. 9 fig. 5.
Gobius Bynoensis Day, Fishes India 1878, p. 284, pl. 61 fig. 3.
Gobius harmandi Sauvage, Bull. Soc. Philom. Paris (7) 4, 1880, p. 49.
Gobius bynoensis Day, Fauna Brit. India Fishes 2, 1889, p. 249.
Gobius (Amblygobius) bynoensis M. Weber, Siboga Exp. Fische 1913, p. 472.
Amblygobius bynoensis McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 251, pl. 35 fig. 2.
Amblygobius bynoensis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 232, pl. 19 fig. 1.
Amblygobius bynoensis Koumans, Zool. Meded. Leiden 18, 1935, p. 140. — Mem. Indian Mus. 13, 1941, p. 249.
Apocryptes lineatus Koumans, o.c. 22, 1940, p. 157 (as synonym).
Apocryptes bivittatus Koumans, o.c. p. 158 (as synonym).

D. 1 VI; D. 2 I. 13-16; A. I. 14-16; P. 17-20; L.l. 70-75; Ltr. 24; Predorsal scales 40.

Body elongate, compressed, height 4-$4^3/_4$ in length, 5-$5^3/_4$ in total length. Head compressed, 3.4-4 in length, $4^3/_4$-5 in total length. Eye $3^1/_2$-4 in head, interorbital $^2/_5$-$^2/_3$ eyediameter. Anterior nostril in a short tube. Snout a little longer than eye, tip before lower margin of eye. Mouth oblique, jaws subequal. Maxillary extends to below anterior half of eye. Teeth in upper jaw in 3 rows, outer enlarged, 4-5 caninoid teeth on each side. In lower jaw 2-3 rows, outer enlarged, laterally on each side 1-2 canines. A large open pore on inner side of anterior nostril, 2 in median line in interorbital, 5 pores in supraopercular groove, 3 along posterior margin of preopercle. Head scaled above behind eye, a few rudimentary scales at upper margin of opercle. Scales of head, nape, breast and belly cycloid, other scales ctenoid. Bases of dorsal fins subcontinuous. First dorsal fin a little lower than body. Second dorsal and anal fin not higher than first dorsal fin, pointed posteriorly. Pectoral fin rounded, not longer than head. Ventral fin a little shorter than head. Caudal fin obtuse, about as long as head. Colour yellowish red above, pearly below. Head with 2 brownish violet bands, bordered with blue, the upper one from eye to beneath first dorsal fin, the lower one from behind maxillary across opercle to base of pectoral fin, ending in a spot on base of this fin. Cheek and opercle with blue spots surrounded by violet; on preopercle an oblique blue streak. Upper part of head and nape on each side with 5-7 blackish violet ocelli, placed in a longitudinal row. Beneath first dorsal fin

2-3 dark, short, transverse streaks, beneath second dorsal fin 4-5 short, oblong, transverse bands. At base of caudal fin a brown spot. Dorsal fins with many pearly spots. Dorsal fins and anal fin with violet margin. Length 94 mm.

Habitat: Singapore; Pulu Brani!; Biliton (Tjirutjup); Java (Bay of Djakarta!, Probolinggo!, Anjer); Madura (Pamekasan!); Bawean; Borneo (Bontang reef!); Kei Islands (Tual!); Aru Islands!. — India, Andamans, Sembilan Islands of W. Malay Peninsula!, Cochin China!, Pulo Condor!, Philippines!, Thursday Island!, Australia (Cape York, Port Darwin!, Cape Grenville!).

Specimen b. (Australia, Sir J. Richardson) seen in British Museum (N.H.), types of *Gobius harmandi* seen in Paris Museum, types of *Apocryptes lineatus* and *A. bivittatus* seen in Macleay Museum, Sydney.

5. **Amblygobius albimaculatus** (Rüpp.) (Fig. 33, p. 136)

Gobius albimaculatus Rüppell, Atl. Reise N. Afr. Fische 1828, p. 135.
Gobius semicinctus Bennett, Proc. Zool. Soc. London 1, 1833, p. 32.
Gobius papilio Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 91.
Gobius phalaena Cuvier & Valenciennes, o.c. p. 92.
Gobius quinqueocellatus Cuvier & Valenciennes, o.c. p. 95.
Gobius albomaculatus Rüppell, Neue Wirbelthiere Fische 1838, p. 137.
Gobius phalaena Bleeker, Nat. Tijdschr. Ned. Indië 2, 1851, p. 244.
Gobius phalaena Günther, Cat. Fishes 3, 1861, p. 67.
Gobius semicinctus Günther, o.c. p. 68.
Gobius albomaculatus Günther, o.c. p. 69.
Gobius albomaculatus Klunzinger, Verh. zool. bot. Ges. Wien 21, 1871, p. 477.
Gobius phalaena Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 178, pl. 111 fig. C.
Aprocryptes fasciatus Macleay, Proc. Linn. Soc. N. S. Wales 8, 1884, p. 268.
Gobius annulatus De Vis, o.c. 9, 1884, p. 688.
Gobius papilio Sauvage, Poissons de Madagascar 1891, p. 367.
Amblygobius phalaena Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 405.
Odontogobius phalaena Seale, Occ. Pap. B. P. Bishop Mus. 4 no. 1, 1906, p. 84.
Gobius (Amblygobius) phalaena M. Weber, Siboga Exp. Fische 1913, p. 472.
Gobius (Amblygobius) albomaculatus M. Weber, o.c. p. 472.
Amblygobius phalaena McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 253, pl. 35 fig. 1.
Amblygobius phalaena Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 253, pl. 30 fig. 3.
Amblygobius phalaena Fowler, Mem. B. P. Bishop Mus. 10, 1928, p. 412.
Amblygobius semicinctus Fowler, o.c. p. 413.
Apocryptodon fasciatus Fowler, o.c. p. 417.

Apocryptodon fasciatus Fowler, o.c. 11 no. 6, 1934, p. 444.
Amblygobius phalaena Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 379.
Amblygobius semicinctus semicinctus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 76, fig. 27.
Amblygobius albimaculatus Koumans, Zool. Meded. Leiden 20, 1937, p. 14.
Apocryptes fasciatus Koumans, o.c. 22, 1940, p. 167 (as synonym).
Gobius annulatus Koumans, o.c. p. 175 (as synonym).

D. 1 VI; D. 2 I. 13-15; A. I. 14; P. 18-20; L.l. 50-55; L.tr. 18-19; Predorsal scales 30.

Body elongate, compressed, height $3^2/_3$-4 in length, $4^3/_5$-$5^1/_4$ in total length. Head compressed, $3^2/_3$-4 in length, $4^1/_2$-$5^1/_4$ in total length. Profile convex. Eye 3-4 in head, interorbital $^2/_3$-1 eye-diameter. Snout obtuse, about as long as eye, tip below inferior margin of eye. Anterior nostril in a short tube. Lips thick. Mouth oblique, jaws equal. Maxillary extends to below anterior half of eye. Teeth in upper jaw in 3 rows, outer enlarged with 4-5 caninoid teeth on each side. Teeth in lower jaw anteriorly in 3 rows, outer enlarged, extending to halfway the jaw; on each side 7-8 caninoid teeth, the last tooth on each side is a strong, curved canine. Tongue truncate. Short mucous canals radiate under eye, two longitudinal canals on cheek. Medially in interorbital space two open pores; behind each eye a large open pore at the beginning of supraopercular groove. Head scaled above behind eye and on upper part of opercle with cycloid scales. Scales of nape, breast and belly cycloid, other scales ctenoid, middle rays of first dorsal fin prolonged, third and fourth longer than height of body. Second dorsal and anal fin lower than body, pointed posteriorly. Pectoral fin obtuse, not shorter than head. Ventral fin pointed, not shorter than pectoral fin. Caudal fin obtusely rounded, longer than head. Colour of upper parts reddish green to purplish, lower parts yellowish. Laterally on head some oblique rows of yellowish ocelli, bordered with violet. On upper part of head and nape a longitudinal row of dark or yellowish ocelli, bordered with violet. On body laterally 5-6 transversal bands placed on the whole body, or only on the anterior part. First dorsal, pectoral and anal fin orange to red. First dorsal fin with one or more dark spots. Caudal fin with dark border, at upper part of base a dark spot. Second dorsal and ventral fin dark to purple. Second dorsal fin with a hyaline submarginal band.

There are some varieties in the pattern of colour:

Variety *semicinctus* Bennett. Back light olivous, belly yellowish green. On lower half of body 5-6 transverse, silvery bands, bordered with olive. The first, second and third from pectoral to ventral fin, fourth from pectoral fin to just behind ventral fin, fifth at beginning of anal fin, sixth much weaker, above anterior half of anal fin. Specimens of this variety are described as *A. semicinctus* (Benn.) and *A. papilio* (C.V.).

Variety *phalaena* C.V. Transversal bands dark, bordered with blue, running from back to belly, placed over the whole body. First from first dorsal fin to ventral fin, second, third and fourth from second dorsal to anal fin, fifth on caudal peduncle. Specimens of this variety are described as *A. phalaena* (C.V.).

Variety *albimaculatus* Rüpp. Between the bands, which are placed as in variety *phalaena,* two longitudinal rows of white spots on dorsal half of the body. Specimens of this variety are described as *A. albomaculatus* (Rüpp.). Length 126 mm.

Habitat: Pulu Weh!; Batu Islands; Cocos Islands (Nova Selma); Nias; Java Sea!; Java (Surabaja!); Bawean; Flores (Larantuka!); Rotti (Pepela bay!); Timor!; Letti; Sulu Islands (Sitankai!); Celebes (Menado, Makassar!); Sangir; Ternate; Ceram! (Peru, Wahai); Nusa Laut!; Ambon; Goram; Banda! (Neira); Kei Islands (Elat!); Tenimber Islands (Wotap!); New Guinea (Andai!). — Red Sea, Zanzibar and Mauritius to Australia and the South Pacific Islands. — In sea.

Type of *Gobius semicinctus* seen in British Museum (N.H.), 3 specimens of *Gobius albomaculatus* Rüpp., collected by Rüppell in Red Sea, seen in British Museum (N.H.), type of *Gobius phalaena* and type of *G. papilio* seen in Paris Museum, cotype of *Apocryptes fasciatus* seen in Australian Museum, Sydney, type and cotype of *Gobius annulatus* seen in Queensland Museum, Brisbane.

6. **Amblygobius sphynx** (C.V.)

Gobius sphynx Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 93.
Gobius sphinx Günther, Cat. Fishes 3, 1861, p. 67.
Gobius deilus Sauvage, Bull. Philom. Paris (7) 4, 1880, p. 47.
Amblygobius sphynx Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 237.
Amblygobius sphynx Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 412.
Amblygobius sphynx Koumans, Zool. Meded. Leiden 18, 1935, p. 138.

D. 1 VI; D. 2 I. 14-15; A. I. 14-15; P. 17-19; L.l. 55; L.tr. 18; Predorsal scales 20-22.

Body elongate, compressed, height $3^3/_5$-4 in length, $4^3/_4$-5 in total length. Head obtuse, compressed, equal to height. Profile convex. Eye 3-4 in head, interorbital $^3/_5$-$^1/_2$ eyediameter. Snout obtuse, a little shorter than eye, tip before or below inferior margin of eye. Anterior nostril in a short tube. Mouth oblique, jaws equal. Maxillary extends to below middle of eye or a little farther. Lips thick. Teeth in upper jaw in 3 rows, outer enlarged, on each side 5-6 caninoid teeth. In lower jaw anteriorly 2-3 rows; outer row enlarged, extends to halfway the jaw and is composed of 6-8 caninoid teeth on each side, last tooth is a large, curved canine. Mucous canals indistinct. An open pore in interorbital, an open pore behind eye at the beginning of supraopercular groove. Head scaled above behind the eyes and on upper parts of opercle with cycloid scales. Scales of nape, breast and belly cycloid, other scales ctenoid. First dorsal fin lower than body, the middle rays are the longest. Second dorsal and anal fin about as high as first dorsal fin, pointed posteriorly. Pectoral fin obtusely rounded, about as long as head. Ventral fin not shorter than pectoral fin, basal membrane very low. Caudal fin obtusely rounded, about as long as head. Colour of upper parts reddish green, lower parts reddish orange. Body with 5-6 blackish to reddish, more or less diffuse, transversal bands. Head with numerous pearl like spots. Dorso-lateral scales with shiny spots. Fins reddish to purple with pearl like spots. Caudal fin at upper part of base with blackish spot. Branchial membrane with blackish streak, which is bordered with orange. Length 110 mm.

Habitat: Singapore; Sulu Islands (Jolo, Sitankai); Borneo; Sangir Islands; Ternate; Batjan (Labuha); Ceram (Wahai); Ambon; Goram; Banda (Neira); New Guinea!. — Red Sea!, Pulo Condor!, Philippines!, Caroline Islands, Pelew Islands, Micronesia. — In sea.

Types of *Gobius sphynx* and *Gobius deilus* seen in the Paris Museum.

24. **Herreogobius** Koumans

(Koumans, Zool. Meded. Leiden 22, 1940, p. 139)

Body elongate, a little compressed, covered with about 36 cycloid scales. Head depressed, naked. Neck with about 8 scales before first dorsal fin, in median line to posterior margin of opercle. Interorbital space about 1 eyediameter. Mouth a little curved, lower jaw prominent. Teeth in both jaws in 4 rows, outer row enlarged. Tongue rounded. Three longitudinal mucous canals as rows of papillae on cheek. Two rows on lower side of head, the outer prolonged along posterior margin of preopercle. Gillopenings not continued forward below. No fleshy flaps on inner edge of shoulder-girdle. First dorsal fin with 6 rays. D. 2 I. 9. Ventral fins united, basal membrane very weak or absent. Caudal fin oblong, shorter than head.

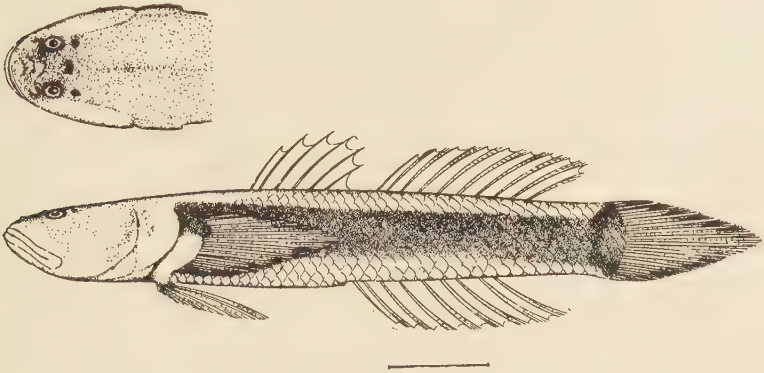

Fig. 34. *Herreogobius malekulae* (Herre). After Herre.

Distribution: Kafal near Misol, New Hebrides.

1. **Herreogobius malekulae** (Herre) (Fig. 34, p. 145)

Rhinogobius malekulae Herre, Journ. Pan Pacific Res. Inst. 6 no. 4, 1931, p. 14 (name only).
Ctenogobius malekulae Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 423. — o.c. 21, 1936, p. 367, fig. 25.
Ctenogobius malekulae Koumans, Zool. Meded. Leiden 22, 1940, p. 139 (examination of type).

D. 1 VI; D. 2 I. 9; A. I. 8; L.l. 36; L.tr. ± 14; Predorsal scales 8.

Body elongate, a little compressed, height more than $6^{1}/_{2}$ in length. Head depressed, $3^{1}/_{2}$ in length. Eye $6^{1}/_{2}$ in head, interorbital a little more than eye. Snout longer than eye, tip before lower margin of eye. Mouth a little curved, lower jaw prominent. Maxillary extends to below middle of eye. Teeth in 4 rows, outer row enlarged. Tongue rounded. Gillopenings not continued forward below. Head with 3 longitudinal mucous canals as rows of papillae on cheek, two rows on lower side of head, the outer prolonged along posterior margin of preopercle. Head naked, the scales on nape begin at posterior margin of opercle. Scales of body cycloid. First dorsal fin obtuse, about as high as body. Second dorsal and anal fin about as high as first dorsal fin. Pectoral fin pointed, shorter than head. Ventral fin a little shorter than pectoral fin, united, the basal membrane is very low or absent. Caudal fin oblong, shorter than head. Colour in spirit yellowish white with a broad dark brown band along the side of body, ending in a large spot on caudal base. On upper part of base of pectoral fin a branch of this band. Top of head, and especially the cheek, darker. Length 30 mm.

Habitat: Kafal near Misol!. — New Hebrides (Bushman bay, Malekula Island!).

Type seen in Field Museum Nat. Hist., Chicago.

25. **Fusigobius** Whitley

(Whitley, Australian Zoologist 6, 1930, p. 122)

Body elongate, compressed, scaled with about 23 ctenoid scales, neck naked. Head scaled above the eyes. Eye about in middle of length of head, interorbital space very narrow. Mouth subhorizontal, lower jaw prominent. No canines. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 9; A. I. 8. Pectoral fin without free rays. Ventral fins united, basal membrane weak or wanting. Caudal fin oblong.

Distribution: Riu Kiu Islands, Philippines and Indo-Australian Archipelago to the Pacific.

1. **Fusigobius neophytus** (Gthr.) (Fig. 35, p. 147)

Gobius neophytus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 174, pl. 108 fig. E.
Rhinogobius neophytus, Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 400, pl. 37 fig. 2.
?*Rhinogobius muscarum* Jordan & Seale, o.c. p. 401, fig. 90.
Rhinogobius neophytus McCulloch, Proc. Linn. Soc. N.S. Wales 36, 1911, p. 423.
Rhinogobius neophytus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 195, pl. 14 fig. 4.
Rhinogobius neophytus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 411.
Ctenogobius neophytus Herre, Notes on Fishes of Stanford Univ. 1, 1934, p. 85. — Field. Mus. Nat. Hist. Zool. 21, 1936, p. 369.
Gobius neophytus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 65.
Rhinogobius muscarum Koumans, Zool. Meded. Leiden 22, 1940, p. 125 (as probable synonym).
Fusigobius neophytus Koumans, o.c. p. 137.

D. 1 VI; D. 2 I. 9; A. I. 8; L.l. 23-24; L.tr. 7; Predorsal scales 4-5.

Body elongate, compressed, height 4.5-4.85 in length. Head 3.2-3.5 in length. Eye 3-3$^1/_2$ in head, interorbital very narrow. Snout pointed, 3 in head, tip before lower margin of eye. Mouth oblique, lower jaw prominent. Upper lip thick. Maxillary extends to below front margin of eye. Teeth in four rows, outer row enlarged, no canines. Tongue rounded. A low naked dermal crest medially on nape. Two longitudinal mucous canals on cheek. One open pore near nostril, one before and one behind eye in median line in interorbital, some pores along posterior margin of preopercle. Head scaled above from a little behind eye with large scales. Scales of body ctenoid, but easily lost. First dorsal fin about as high as body, foremost rays are the longest. Second dorsal and anal fin a little lower than height of body. Caudal fin rounded, as long as head. Basal membrane of ventral fins very weak to absent. Colour whitish with brown and white spots on head and body. A longitudinal row of larger spots on the middle of the side, ending in a large spot on base of caudal fin. Often a blackish spot near the top between first and second ray of first dorsal fin, rest of the fin with minute blackish spots. Second dorsal and caudal fin with transverse spots. Other fins colourless. Length 62 mm.

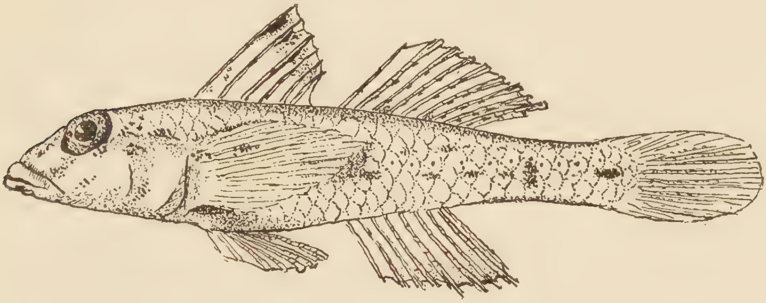

Fig. 35. *Fusigobius neophytus* (Gthr.). After Jordan & Seale.

Habitat: Java (Bay of Djakarta: Island Hoorn!); Flores (Pulu Serbete!); Sulu Islands (Sitankai). — Riu Kiu Islands, Philippines (Palawan, Mindoro!), Ponapé, Huahive, Tahiti, Raiatea, Fiji, Samoa (?Pago Pago!, Apia).

Type of *Gobius neophytus* seen in British Museum (N.H.), type of *Rhinogobius muscarum* seen in U.S. Nat. Museum.

With some hesitation the following species is brought to *Fusigobius*. It differs in some characters, but otherwise, it shows great affinity to *Fusigobius neophytus*.

(? **Fusigobius) labiatus** (M. Weber)

Gobius (Rhinogobius) labiatus M. Weber, Siboga Exp. Fische 1913, p. 470.

D. 1 VI; D. 2 I. 7; A. I. 8; P. 17; L.l. 28; L.tr. 7-8; Predorsal scales ± 40.

Body elongate, compressed, height 5-6 in length, 6-7 in total length. Head 3.3 in length, 4 in total length, compressed. Profile nearly straight from first dorsal fin to eye, from eye bending downward. Eye a little more than 3 in head, interorbital narrow. Snout a little longer than eye, tip below inferior margin of eye. Lips very thick. Mouth small, horizontal, jaws subequal. Maxillary extends to below front border of eye. Teeth small; in lower jaw on each side a canine. Gillopenings not very wide, isthmus broad. A mucous canal from anterior nostril to edge of mouth, from here horizontal on cheek, bending later on upward and ending in an open pore behind eye at the beginning of supraopercular groove. Medially in interorbital an open pore. In front of eye a pore on each side, behind eye a pore in median line. Two on each side, the lower of which lies in the supraopercular groove. Some open pores along posterior margin of preopercle. Head scaled above behind eye, but median line naked. Scales of body ctenoid. No scales on breast. Dorsal fins and anal fin lower than body. Pectoral fin a little shorter than head. Ventral fin oblong, as long as head, basal membrane with an assessory lobe on each side. Caudal fin truncate, about as long as head. Colour brown. Head, anterior part of body and fins darker. Length 24 mm.

Habitat: Flores (Labuan Badjo!).

Type seen in the Amsterdam Museum.

26. **Zonogobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 323)

Body elongate, covered with 22-30 ctenoid scales on the posterior part of body, anterior part naked. Head compressed, obtuse, naked. Snout about as long as eye. Mouth oblique. Teeth in upper jaw with the outer row enlarged, in lower jaw inner row enlarged, laterally some canines. Gillopenings large, continued far forward

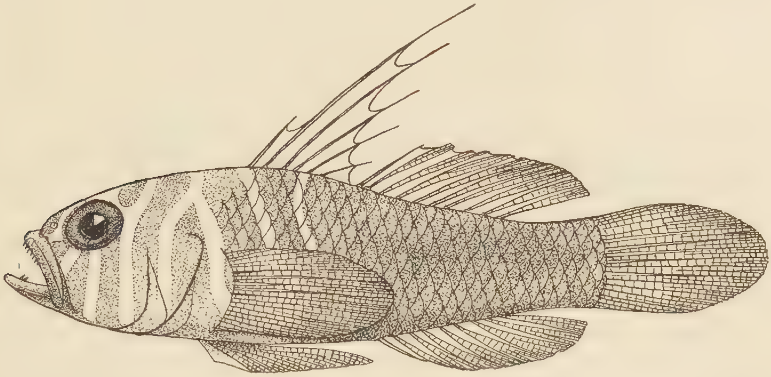

Fig. 36. *Zonogobius semidoliatus* (C.V.). × 5.

below, isthmus narrow. Dorsal fins very close together. First dorsal fin with 6 rays. D. 2 I. 8-9; A. I. 7-8. Ventral fins united, basal membrane wanting or weak. Caudal fin rounded.

Distribution: Red Sea to the Pacific.

1. **Zonogobius semidoliatus** (C.V.) (Fig. 36, p. 149)

Gobius semidoliatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 67.
Gobius semidoliatus Günther, Cat. Fishes 3, 1861, p. 31.
Gobius semifasciatus Kner, Sitz. ber. Ak. Wien 58, 1868, p. 326, pl. 5 fig. 15.
Gobius semidoliatus Klunzinger, Verh. zool. bot. Ges. Wien 21, 1871, p. 475.
Gobius semidoliatus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 174, pl. 109 fig. H.
Gobius semidoliatus Day, Fishes India 1878, p. 295, pl. 59 fig. 6. — Fauna Brit. India Fishes 2, 1889, p. 266.
Zonogobius semidoliatus Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 397, fig. 86.
Zonogobius boreus Snyder, Proc. U.S. Nat. Mus. 36, 1909, p. 605. — o.c. 42, 1912, pl. 59 fig. 3.
Gobius semidoliatus M. Weber, Siboga Exp. Fische 1913, p. 462.
Gobius semidoliatus De Beaufort, Bijdragen Dierkunde 1913, p. 139.
Zonogobius semidoliatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 200, pl. 30 fig. 2.
Zonogobius semidoliatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 414.
Zonogobius boreus Koumans, Zool. Meded. Leiden 22, 1940, pp. 128, 144 (as synonym).
Zonogobius semidoliatus Koumans, Mem. Indian Mus. 13, 1941, p. 250.

D. 1 VI; D. 2 I. 8-9; A. I. 7-8; P. 16-17?; L.l. 27; L.tr. 9-10.

Body elongate, compressed, height $2^2/_3$-$3^3/_4$ in length, 4 in total length. Head subcylindrical, $2^2/_3$ to more than 3 in length, $3^1/_2$ in total length. Profile convex. Eye 3 in head, interorbital $^1/_5$ eyediameter. Snout obtuse, a little shorter than eye, tip before middle of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below anterior half of eye. Teeth in each jaw in some rows, outer enlarged. In upper jaw in front a short inner row of enlarged teeth; in lower jaw inner row enlarged, some canines laterally in lower jaw. Tongue rounded. Gillopenings continued forward below, isthmus narrow. Head naked. Body naked on anterior part to insertion of first dorsal fin. Scales of body ctenoid. Second, third and fourth rays of first dorsal fin filiform. Second dorsal and anal fin lower than body. Caudal fin rounded, shorter than head. Pectoral fin as long as head. Ventral fin as long as head, basal membrane low or wanting. Colour brown with about 7-8 broad, pale crossbars, edged with dark brown on head and anterior part of body, becoming indistinct and disappearing on posterior half of body. Fins uniform. Length 30 mm.

Habitat: Singapore; Flores (Labuan Badjo!, Pulu Serbete!); Solor (Lamakera!); Timor (Kupang!); Sulu Islands (Sanguisiapo!, Sitankai); Siau (Sawan!); Salibabu (Lirung!); Morotai!; Aru Islands (Island Jedan!); Waigeu (Saonek!). — Red Sea!, India!, Siam, Andamans!, Riu Kiu Islands, Japan (Misaki!) to the South Pacific Islands. — On coral reefs and seabottom.

Type of *Gobius semidoliatus* seen in Paris Museum, type of *Zonogobius boreus* seen in U.S. Nat. Museum, cotype in Stanford University.

27. **Awaous** Cuvier & Valenciennes

(Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 97)

Chonophorus Poey, Mem. de Cuba 2, 1856-1858, p. 274.
Trichopharynx Ogilby, Proc. Linn. Soc. N.S. Wales 22, 1897, p. 769.

Body elongate, anteriorly subcylindrical, posteriorly compressed, covered with 40-80 ctenoid scales; breast and belly scaled. Head elongate, scaled above behind the eyes and sometimes on upper parts of preopercle and opercle. Eye situated high in head, bony interorbital somewhat less than 1 eyediameter. Snout very long, much longer than eye. Anterior nostril in a short tube. Mouth oblique, lips thick, upper jaw prominent. Teeth in both jaws in several rows, the outer somewhat enlarged, no canines. Tongue bilobate. Mucous canals not distinct. Gillopenings a little longer than the breadth of base of pectoral fin, isthmus broad. Inner edge of shouldergirdle with some fleshy flaps. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 I. 9-11. Ventral fins united, oblong. Pectoral fin without free silklike rays, base scaled. Caudal fin obtuse, shorter than head.

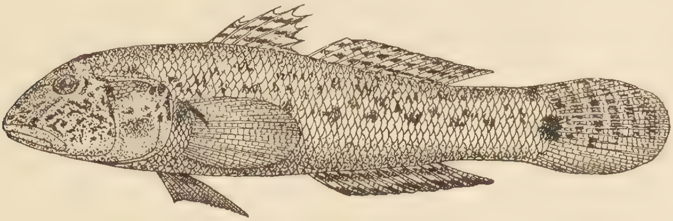

Fig. 37. *Awaous grammepomus* (Blkr.). n.s.

Distribution: All tropical regions.

Key to the Indo-Australian species of Awaous

1. L.l. 50-52; L.tr. 13-15; Predorsal scales 13-15. 1. *A. grammepomus* p. 151.
2. L.l. 51-58; L.tr. 15-19; Predorsal scales 17-24 2. *A. stamineus* p. 153.

1. **Awaous grammepomus** (Blkr.) (Fig. 37, p. 151)

Gobius melanocephalus Bleeker, Verh. Bat. Gen. 22, 1849, p. 33.
Gobius personatus Bleeker, o.c. p. 34.
Gobius grammepomus Bleeker, o.c. p. 34.
Gobius personatus Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, fig. 4.
Gobius grammepomus Bleeker o.c. 9, 1855, p. 200 (pro parte, *melanocephalus* and *personatus* as synonyms, see Int. Rules art. 28).
Gobius grammepomus Günther, Cat. Fishes 3, 1861, pp. 64, 554 (pro parte).
Gobius stoliczkae Day, Proc. Zool. Soc. London 1870, p. 692.
Gobius personatus Day, Fishes India 1878, p. 292, pl. 63 fig. 6. — Fauna Brit. India Fishes 2, 1889, p. 263.
Gobius grammepomus M. Weber, Zool. Ergebnisse 3, 1894, p. 411.
Gobius grammepomus var. *melanocephala* M. Weber, o.c. p. 411.
Gobius melanocephalus M. Weber & De Beaufort, Versl. Afd. Wis- en Natuurk. Ak. Wet. Amsterdam 1912, pp. 135, 137.
?*Awaous macropterus* Duncker, Mitt. Nat. Hist. Mus. Hamburg 29, 1912, p. 252, fig. 1.
Gobius melanocephalus M. Weber, Nova Guinea 9, Zool. 4, 1913, p. 599.

Gobius melanocephalus De Beaufort, Bijdragen Dierkunde 1913, p. 139 (not the synonyms).
Chonophorus melanocephalus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 216, pl. 17 fig. 1 (pro parte).
Chonophorus ocellaris Herre, o.c. p. 218, pl. 17 fig. 2 (pro parte?).
Chonophorus melanocephalus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 410.
?*Chonophorus guamensis* Giltay, Mem. Mus. Hist. Nat. Belgique, Hors Serie 5, 1933, p. 96.
Awaous ocellaris Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 75 (pro parte).
Awaous melanocephalus Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 151.
Chonophorus melanocephalus Koumans, Zool. Meded. Leiden 22, 1940, p. 188 (pro parte, examination of specimens).
Awaous grammepomus Koumans, Mem., Indian Mus. 13, 1941, p. 251.

D. 1 VI; D. 2 I. 10; A. I. 10; P. 15-17; L.l. 50-52; L.tr. 13-15; Predorsal scales 13-15.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_2$-$6^1/_2$ in length, $5^1/_2$-$7^1/_2$ in total length. Head obtuse, convex, $3^1/_3$-$3^3/_4$ in length, profile convex. Eye 4-5 in head, interorbital $^2/_5$-1 eyediameter. Snout obtuse, in young specimens a little longer than eye, in adult much longer than eye, tip below lower margin of eye. Lips thick. Upper jaw prominent. Maxillary extends to below anterior margin of eye or not so far. Teeth in lower jaw equal, in upper jaw outer row a little enlarged. Tongue bilobate. Scales of head cycloid. Head scaled above behind eye and along upper margin of opercle, sometimes some scales along posterior margin of preopercle. Scales of breast and belly cycloid, of body ctenoid. Distance between the dorsal fins less than diameter of eye. First dorsal fin about as high as body, second, third and fourth rays are the longest. Second dorsal and anal fin lower than body, pointed posteriorly. Pectoral fin obtuse, longer than head without snout. Ventral fin obtuse, not, or a little shorter than pectoral fin. Caudal fin obtusely truncate, a little shorter than head. Colour olive green, lighter below. Head violet to olive green, two oblique blackish streaks from eye to maxillary. Back and sides with irregular blackish streaks. Caudal fin with 7-9 transversal blackish streaks. In middle of base of caudal fin and superiorly on base of pectoral fin a blackish dot. Ventral and caudal fin often blackish violet. Length 140 mm.

Nom. indig.: Kadangan, Bosok, Pusok (Jav.), Ikan Tawor (Tapatuan).

Habitat: Sumatra (Telok betong, Padang, Labuan Batu!, Tapatuan!); Java (Tjiringin, Sudimanik, Menes, Tjiliwong, Banjumas, Purworedjo, Patjitan, Majang!); Bali (Boleleng); Sumba!; Sumbawa (Sori Nee!, Taliwong!): Flores (river near Reo!, Alo Wai river!, Mbura!); Timor (Kupang!, Noil Enfut!, Mota Berluli!, Koinino river!); Borneo; Celebes (Lagusi, Sawangan, Klabatdiatas, river near Balang nipa! Tulabello!); Karakelong (Duata!); Buton (Bau bau river!); Batjan (Labuha); Buru (Kajeli); Ceram (river Tubah!, river Riuapa); Ambon; Waigeu (river Rabiai!); ?Pisang Islands; New Guinea (river Mbai!). — India!, Ceylon!, Philippines!. — In rivers and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum.

2. **Awaous stamineus** (Val.)

Gobius stamineus Valenciennes, Zool. Voy. Bonite 1842, p. 179, pl. 5 fig. 5.
Gobius grammepomus Bleeker, Nat. Tijdschr. Ned. Indië 9, 1855, p. 200 (pro parte).
Gobius (Awaous) litturatus (Heckel) Steindachner, Sitz. ber. Ak. Wien 42, 1860, p. 289, pl. 1 figs. 4, 5.
Gobius grammepomus Günther, Cat. Fishes 3, 1861, pp. 64, 554 (pro parte).
Euctenogobius striatus Day, Proc. Zool. Soc. London 1868, p. 272, fig.
Gobius striatus Day, Fishes India 1878, p. 292, pl. 62 fig. 6.
Gobius stamineus Günther, Zoology Challenger Exp. 1 prt. 6, 1880, p. 59.
Gobius striatus Day, Fauna Brit. India Fishes 2, 1889, p. 262.
Gobius grammepomus M. Weber in Semon, Zool. Forschungsreisen 5, 1895, p. 269 (not of Blkr.).
Gobius melanocephalus M. Weber, Siboga Exp. Fische 1913, p. 465 (not of Blkr.).
Chonophorus melanocephalus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 216 (pro parte).
Awaous ocellaris Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 75 (pro parte).
Gobius personatus Koumans, Zool. Meded. Leiden 22, 1940, p. 168 (as synonym).
Gobius striatus Koumans, o.c. p. 168 (as synonym).
Chonophorus melanocephalus Koumans, o.c. p. 188 (pro parte, examination of specimens).
Awaous stamineus Koumans, Mem. Indian Mus. 13, 1941, p. 252.

D. 1 VI; D. 2 I. 10; A. I. 10; P. 16-18; L.l. 51-58; L.tr. 16-19; Predorsal scales 17-24.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^2/_5$-$4^2/_3$ in length, $5^1/_2$-6 in total length. Head obtusely convex, $3^1/_4$-$3^3/_4$ in length, profile convex. Eye $4^1/_2$-5 in head, interorbital $^3/_4$-1 eyediameter. Snout obtusely convex, longer than eye, tip below lower margin of eye. Lips thick. Upper jaw prominent. Maxillary extends to below anterior margin of eye or not so far. Teeth in upper jaw of outer row a little enlarged, in lower jaw equal. Tongue bilobate. Head scaled above behind eye and along upper margin of opercle, sometimes some scales on posterior part of cheek. Scales on opercle, breast and belly cycloid, on occiput and rest of body ctenoid. Distance between dorsal fins less than diameter of eye. Second, third and fourth rays of first dorsal fin are the longest. Second dorsal and anal fin lower than body, pointed posteriorly. Pectoral fin obtuse, longer than head without snout. Ventral fin obtuse, a little or not shorter than pectoral fin. Caudal fin obtusely truncate, shorter than head. Colour olive green, belly yellowish. Head with irregular blackish spots. Two longitudinal blackish streaks from eye to maxillary. Body with blackish spots. Fins yellowish. First dorsal fin with 3-4, second dorsal fin with 5-6 longitudinal dark streaks. In middle of base of caudal fin a blackish dot. Pectoral fin on upper part of base with a blackish spot. Length 170 mm.

Nom. indig.: Seti (Ceram).

Habitat: Java!; Savu (Seba!); Sumbawa (Brang Nee river!, Wera river!); Flores (Ipi river!, Nanga Panda!); Rotti!; Wetter (river near Ilmedo!, Meta Sau!); Morotai!; Taliabu (Wai Meha!); Batjan (Labuha); Ceram; Ambon. — India!, Malaya (Port Swettenham!), Philippines!, Hawaii Islands!. — In rivers and estuaries.

Type of *Gobius stamineus* seen in Paris Museum, specimens of *Gobius striatus* from collection Day seen in Indian Museum at Calcutta, Leiden Museum and Australian Museum, Sydney.

Note: The specimen *Gobius baliurus* Kuhl & van Hasselt, no. 1895 Leiden Museum, mentioned by Koumans, Prel. Rev. Gobioid Fishes 1931, p. 87, from which he noted that it did not belong to *Gobius baliurus,* but to *Awaous,* belongs to this species, see Koumans, Zool. Meded. Leiden 18, 1935, p. 141.

28. **Tamanka** Herre

(Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 220)

Body elongate, compressed, covered with 36-54 ctenoid scales. Nape scaled. Head subcylindrical, scaled above behind the eyes to nearly naked, opercle scaled with many small cycloid scales. Eye in anterior half of head, interorbital space broader than eye. Snout longer than eye. Mouth oblique. Teeth in upper jaw in a band and a separate outer row of coarser teeth, more widely set than the other teeth; in lower jaw a band of teeth, none enlarged. Tongue truncate to scarcely emarginate. Gillopenings wide, isthmus moderate. Inner edge of shouldergirdle without fleshy flaps, or with some small flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 7-8; A. I. 7-8. Pectoral fin without free silklike rays. Ventral fins united. Caudal fin rounded.

Distribution: Indo-Australian Archipelago and Philippines.

Note: *Tamanka* is very close to *Mugilogobius* Smitt, Öfv. Kon. Ak. Forh. Stockholm 1899, p. 552. *Vaimosa* Jordan & Seale, Bull. Bur. Fisheries 25 (1905) 1906, p. 395 is considered to be a synonym of *Mugilogobius*. According to Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 220, *Tamanka* differs from *Mugilogobius* by more numerous scales in the longitudinal line, 38-54 instead of 37, and in having many small scales on opercle instead of a few large scales. These characters are not so exact, that it is possible to decide whether a species as *Tamanka ubinensis* Herre, which has about 38 scales in L.l. and 18 scales on the opercle, belongs to *Tamanka* or to *Mugilogobius*. Provisionally I keep the two genera separate, and bring *T. ubinensis* to *Tamanka,* as it occurs in the region where the other species of *Tamanka* are found.

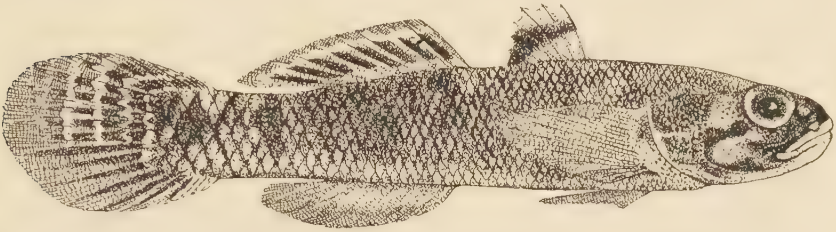

Fig. 38. *Tamanka cavifrons* (M. Weber). × 2½.

Vaimosa was described from Samoa, *Mugilogobius* from Japan, China and Queensland. Further investigations can decide whether it is more correct to unite *Tamanka* and *Mugilogobius*.

Key to the Indo-Australian species of Tamanka

1. Less than 40 scales in longitudinal line.
   A. Height of body 3½-4 in length . . . . 1. *T. latifrons* p. 156.

B. Height of body $5^{1}/_{4}$ in length . . . . . . 2. *T. ubinensis* p. 157.
2. More than 40 scales in longitudinal line.
A. L.l. ± 45; L.tr. 12. Body with cross stripes. 3. *T. cavifrons* p. 157.
B. L.l. 48; L.tr. 14. No cross stripes on body. 4. *T. sarasinorum* p. 158.
C. L.l. 50; L.tr. 16. Body yellowish brown with dark blotches . . . . 5. *T. mertoni* p. 159.
D. L.l. 52-54; L.tr. 17-18. Body dark without blotches. . . . . 6. *T. siitensis* p. 160.
E. L.l. 52; L.tr. 16. Body with 10 vertical cross stripes . . . . 7. *T. tagala* p. 160.

1. **Tamanka latifrons** (Blgr.)

Gobius latifrons Boulenger, Proc. Zool. Soc. London 1897, p. 427, pl. 28 fig. 2.
Gobius latifrons M. Weber, Bijdragen Dierkunde 1913, p. 212.
Vaimosa latifrons Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 166, figs. 20, 21.
Vaimosa cagayanensis Aurich, o.c. p. 169, fig. 22.

D. 1 VI; D. 2 I. 8; A. I. 7-8; P. ± 15; L.l. 36; L.tr. 12; Predorsal scales ± 20.

Body elongate, compressed, height $3^{1}/_{2}$-$4^{1}/_{2}$ in length, $4^{1}/_{2}$-$5^{1}/_{2}$ in total length. Head a little depressed, $3^{1}/_{4}$-$3^{1}/_{2}$ in length, 4-$4^{1}/_{4}$ in total length. Profile a little concave, descending abruptly before eye. Eye 4 in head, interorbital a little less than 1 eyediameter. Snout obtuse, about as long as eye, tip before inferior margin of eye. Anterior nostril in a short tube. Mouth a little oblique, upper jaw a little prominent. Maxillary extends to below anterior half of eye. Teeth small, in several rows. Outer row in upper jaw a little enlarged, widely spaced. No canines. Tongue truncate to scarcely bilobate. Three mucous canals run longitudinally on cheek, one on each side over eye. No open pores. Gillopenings a little continued forward below, isthmus moderate. Inner edge of shouldergirdle with some small fleshy flaps. Head scaled above from a little behind the eye and on opercle with small scales, cheek naked. Scales of body feebly ctenoid, becoming cycloid anteriorly. Dorsal fins lower than body. Caudal fin rounded, shorter than head. Colour olive with dark brown spots. Fins greyish to brown. A dark spot on posterior half of second dorsal fin. Length 47 mm.

Nom. indig.: Piniponro (Buginese).

Habitat: Celebes (Matana lake!, Kalaena river, Mahalona lake, Timampu, Towuti lake). — ?Sulu Islands (Cagayan). — In fresh water.

Types seen in British Museum (N.H.).

2. **Tamanka ubinensis** Herre

Tamanka ubinensis Herre, Bull. Raffles Mus. 13, 1937, p. 41, pl. 3.
Tamanka ubinensis Koumans, Zool. Meded. Leiden 22, 1940, p. 153.

D. 1 VI; D. 2 I. 8; A. I. 8; L.l. ± 38; L.tr. 14; Predorsal scales 22.

Height of body $5^1/_4$ in length. Head subcylindrical, 3.2 in length. Eye 4 in head, interorbital $^1/_2$ eyediameter. Snout as long as eye, tip before lower margin of eye. Anterior nostril tubular. Mouth oblique, lower jaw prominent. Maxillary extends to below front margin of eye. Two longitudinal mucous canals on cheek, a third along its lower margin. Head scaled above behind the eyes, opercle with 18 scales, cheek naked. Vertical fins lower than body. Middle rays of first dorsal fin are the longest. Caudal fin rounded, as long as head. Colour light brown with eight indistinct darker brown transverse stripes on back, two before and two behind first dorsal fin, three below second dorsal fin, one on caudal peduncle. On sides of body irregular dark brown spots, two distinct spots at caudal base. A dark brown stripe from eye to upper lip, one from eye diagonally across preopercle, beginning with a curved branch below the eye. From end of mouth a dark brown stripe longitudinally on cheek. On nape and opercle brown spots. Upper three fourths of caudal fin with spotted rays. First dorsal fin whitish with dark brown dots, a black ocellus on its posterior part. Rays of second dorsal fin with 4 rows of spots. Ventral fin and anal fin more or less dusky. Length 38 mm.

Habitat: Pulu Ubin near Singapore!.

Type seen in Stanford University.

3. **Tamanka cavifrons** (M. Weber) (Fig. 38, p. 155)

Gobius cavifrons M. Weber, Notes Leyden Mus. 21, 1909, p. 152. — Abh. Senckenb. Naturf. Ges. 34, 1911, p. 36. — Siboga Exp. Fische 1913, p. 462, fig. 89.
?*Tamanka maculata* Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 154.
?*Vaimosa karatunensis* Aurich, o.c. p. 168.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 16; L.l. ± 45; L.tr. 12; Predorsal scales 20-22.

Body elongate, compressed, height $4^1/_4$-$4^1/_2$ in length. Head depressed, $3^1/_4$-$3^1/_2$ in length. Profile a little concave over eye. Eye $3^1/_4$-$3^1/_2$ in head, interorbital about 1 eyediameter. Snout blunt, a little shorter than eye. Mouth a little oblique, jaws subequal. Maxillary extends to below middle of eye. Teeth in several rows, no canines. Tongue truncate. Gillopenings a little longer than base of pectoral fin, isthmus broad. Head scaled above from a little behind the eyes, cheek naked, opercle totally scaled with small cycloid scales. Scales of body ctenoid posteriorly, becoming cycloid anteriorly. First dorsal fin about half of height of body, third ray is the longest. Second dorsal and anal fin lower than body. Caudal fin broad, rounded, shorter than head. Pectoral fin a little shorter than head. Ventral fin as long as head without snout. Colour brown with irregular dark cross stripes on body and caudal fin. First dorsal fin with dark longitudinal band on upper half. The membranes between the rays of second dorsal fin have each a dark stripe, which form together a dark band halfway the fin. Pectoral, ventral and anal fin dark. Length 40 mm.

Habitat: Ternate (Sula Takomi di bawah!); Lombok (Ampenam!); Aru Islands (Dobo!, Gomo-Gomo Barkai); ?Sulu Islands (Jolo Timpuk lake); ?Talaud Islands (Karatun). — In freshwater.

Types seen in the Amsterdam Museum.

Note: The two specimens from Seltutti Kobroor, Aru Islands, mentioned by M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 36, belong to *Stigmatogobius hoevenii* (Blkr.).

4. **Tamanka sarasinorum** (Blgr.)

Gobius sarasinorum Boulenger, Proc. Zool. Soc. London 1897, p. 427, pl. 28 fig. 1.

Gobius sarasinorum M, Weber, Bijdragen Dierkunde 1913, p. 212.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 17; L.l. 48; L.tr. 14; Predorsal scales ± 22.

Body elongate, compressed, height $4^1/_4$ in length, $5^1/_4$ in total length. Head subcylindrical, $3^1/_4$ in length, 4 in total length. Profile concave, descending abruptly before eye. Eye 4-$4^1/_2$ in head, interorbital $^3/_4$ eyediameter. Snout a little longer than eye, tip before inferior margin of eye. Lips thick. Anterior nostril in a tube. Mouth horizontal, jaws subequal. Maxillary extends to below anterior half of eye. Teeth small, in several rows. In upper jaw outer row a little enlarged, widely spaced. No canines. Tongue truncate to scarcely bilobate. Three mucous canals run longitudinally on cheek, one on each side over eye. No open pores. Gillopenings a little continued forward below, isthmus moderate. Head scaled from a little behind the eyes and on opercle with small scales, cheek naked. Scales of body feebly ctenoid, becoming cycloid anteriorly. Dorsal fins lower than body. Caudal fin oblong, shorter than head. Colour dark brown above, sometimes lighter below. Fins blackish. Ventral fin sometimes whitish. Length 80 mm.

Nom. indig.: Bungu (Barréö).

Habitat: Celebes (Posso lake!). — In fresh water.

Types seen in British Museum (N.H.).

5. **Tamanka mertoni** (M. Weber)

Gobius Mertoni M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 37, figs. 5, 6.

D. 1 VI; D. 2 I. 7; A. I. 7; P. 16; L.l. 50; L.tr. 16; Predorsal scales 20.

Body elongate, height $5^2/_3$ in length, 7 in total length. Head $3^1/_3$ in length, 4 in total length. Eye 4 in head, interorbital $^3/_4$ eyediameter. Snout $^1/_2$-$^2/_3$ of eye, tip before lower margin of eye. Mouth a little oblique. Maxillary extends to below middle of eye. Teeth in 4-5 rows in each jaw, outer enlarged. Tongue ermarginate. Head scaled above and on opercle with cycloid scales. Scales of nape cycloid, other scales ctenoid. First dorsal fin as high as body, first and second rays are the longest. Second dorsal and anal fin $^1/_2$ of height of body. Pectoral fin as long as postorbital part of head. Ventral fin as long as head without snout. Caudal fin oblong, $^2/_3$ of head. Colour in spirits yellowish brown with dark blotches on body. Head with two dark longitudinal stripes and an oblique one on opercle. Rays of caudal fin spotted. First dorsal fin with black longitudinal stripe. Second dorsal fin with a row of black blotches. Length 24 mm.

Habitat: Aru Islands (Udjir!, Dobo).

Types seen in the Amsterdam Museum.

Note: One specimen from Panua Bori, Wokam, Aru Islands, does not agree with the description, having L.l. 32; L.tr. ± 12. This specimen, which was kindly sent on loan by the Senckenbergische Naturforschende Gesellschaft in Frankfurt a. M., probably belongs to *Stigmatogobius*.

6. **Tamanka siitensis** Herre

Tamanka siitensis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 220, pl. 17 fig. 3.
Tamanka siitensis Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 152, fig. 17.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 16; L.l. 52-54; L.tr. 17-18; Predorsal scales 20-24.

Body elongate, compressed, height $3^1/_4$-4 in length. Head subcylindrical, dorsally flattened, $2^1/_2$-$2^3/_4$ in length. Profile concave, descending abruptly before eye. Eye about 4 in head, interorbital 1 eyediameter. Snout equal to eye, tip before inferior margin of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below posterior margin of eye or not so far. No canines. Tongue scarcely bilobate. Three longitudinal mucous canals on cheek. No open pores. Gillopenings a little continued forward below, isthmus moderate. Inner edge of shouldergirdle without flaps. Head scaled above from a little behind the eyes, cheek naked, opercle with small scales. Scales of body weakly ctenoid posteriorly, cycloid anteriorly. First dorsal fin lower than body, third ray is the longest. Pectoral fin as long as head without snout. Ventral fin as long as postorbital part of head. Caudal fin oblong, shorter than head. Colour dark, blackish. First and second dorsal fin with white band near the margin. Ventral fin often with pale margin along the sides. Length 90 mm.

Habitat: Sulu Islands (Jolo Lake Siit!, Panamoa lake!). — Mindanao (Titunod river). — In fresh water.

The types are evidently lost. Specimens from Lake Siit, June 11, 1921, collected and determined by Herre, seen in U.S. Nat. Museum and Stanford University.

7. **Tamanka tagala** Herre

Tamanka tagala Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 222.
Tamanka tagala Koumans, Zool. Meded. Leiden 22, 1940, p. 188.

D. 1 VI; 2 I. 7; A. I. 7; L.l. 52; L.tr. 16; Predorsal scales 25-30.

Body elongate, compressed, height 4.7 in length. Head depressed, 3 in length. Profile nearly straight. Eye a little shorter than snout, interorbital about 1 eyediameter. Snout blunt, 4.1 in head. Mouth oblique, jaws equal. Maxillary extends to below middle of eye. Teeth in both jaws in 4 rows, outer row in upper jaw enlarged, distant. Head scaled above from above opercle, cheek naked, opercle scaled with about 7 rows of cycloid scales. Scales of body ctenoid posteriorly, becoming cycloid anteriorly. First dorsal fin lower than body, third ray is the longest. Second dorsal fin as high as body. Anal fin lower than body. Pectoral fin shorter than head. Ventral fins much shorter than head. Caudal fin shorter than head. Colour after Herre: "in alcohol very pale brownish yellow, with about ten irregular brown or dark brown crossbars over back, each dividing into two bars which extend down the sides vertically; a large, blackish brown spot on opercle; a blackish brown bar on basal part of caudal; two broad brown bars cross cheek, one behind eye, one behind mouth; a large black blotch on upper part of first dorsal, from third to fifth spines inclusive, the second dorsal faintly specked with brown, the caudal crossbarred with brown; the other fins uniform pale brown or like the body." Length 42 mm.

Habitat: Sitankai, Sulu Islands. — Philippines (Luzon).

Type and cotype seen in Bureau of Science, Manila.

29. **Glossogobius** Gill

(Gill, Ann. Lyc. Nat. Hist. New York 7, 1862, p. 46)

Cephalogobius Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 320.
?*Stupidogobius* Aurich, Int. Rev. Hydrobiol. u. Hydrograph. 38, 1938, p. 149.

Body elongate, anteriorly cylindrical, posteriorly compressed, covered with 25-40 ctenoid scales, becoming cycloid on the head. Head depressed, pointed, scaled above behind the eyes; upper parts of cheek and opercle sometimes scaled. Bony interorbital $^1/_3$-$^3/_4$ eyediameter. Snout longer than eye. Anterior nostril in a short tube. Mouth a little oblique, lower jaw prominent. Maxillary not or nearly not prolonged posteriorly. Teeth in both jaws in several rows, outer and inner one enlarged, uneven, widely set, outer row curved. Tongue bilobate. Gillopenings far continued forward below, isthmus narrow. Inner edge of shouldergirdle without fleshy flaps.

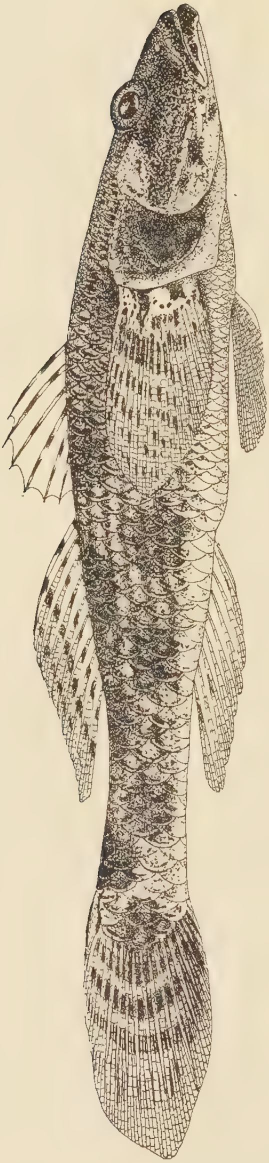

Fig. 39. *Glossogobius giuris* (H. B.). n.s. After M. Weber.

Some longitudinal mucous canals on cheek. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 and A. I. 6-10. Ventral fins united, oblong. Pectoral fin without free silklike rays, base scaled. Caudal fin oblong to pointed.

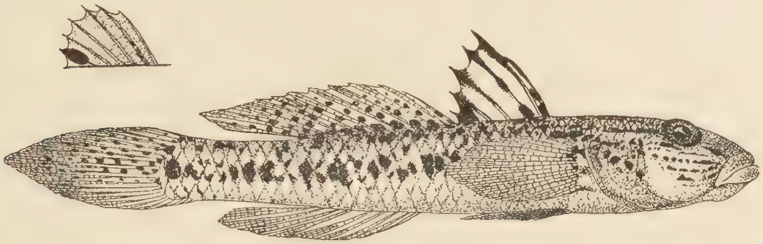

Fig. 40. *Glossogobius giuris* (H. B.), with D. 1 of another specimen. n.s. After M. Weber.

Distribution: From the East coast of Africa to Japan, Australia and the South Pacific.

Key to the Indo-Australian species of Glossogobius

1. 7-9 scales in a transverse line. First dorsal fin with 2 ocelli. Iris of eye with a process in pupil. 1. *G. biocellatus* p. 163.
2. 9-14 scales in a transverse line. First dorsal fin with one black spot or without spot. Iris without process in pupil . . . . 2. *G. giuris* p. 165.

1. **Glossogobius biocellatus** (C. V.)

Gobius biocellatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 73.
Gobius eleotrioides Bleeker, Verh. Bat. Gen. 22, 1849, p. 25.
Gobius sumatranus Bleeker, Nat. Tijdschr. Ned. Indië 7, 1854, p. 83.
Gobius biocellatus Günther, Cat. Fishes 3, 1861, p. 20.
Gobius sumatranus Günther, o.c. p. 31.
Gobius biocellatus Day, Fishes India 1878, p. 289, pl. 63 fig. 8. — Fauna Brit. India Fishes 2, 1889, p. 258.
Gobius biocellatus M. Weber, Zool. Ergebnisse 3, 1894, p. 410.
Glossogobius aglestes Jordan & Seale, Proc. U.S. Nat. Mus. 28, 1905, p. 798, fig. 16.
Glossogobius vaisiganis Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 403, fig. 93.
Glossogobius aglestes Seale, Philipp. Journ. Sci. 5 no. 4, 1910, p. 286.
Gobius (*Glossogobius*) *biocellatus* M. Weber, Siboga Exp. Fische 1913, p. 470.
Glossogobius biocellatus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 237.

Glossogobius biocellatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 156, pl. 12 fig. 3.
Glossogobius biocellatus Fowler, Mem. B. P. Bishop Mus. 10, 1928, p. 402.
Glossogobius biocellatus Fowler, Occ. Pap. B. P. Bishop Mus. 9 no. 8, 1932, p. 15.
Glossogobius biocellatus Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 360.
Glossogobius biocellatus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 87 (pro parte).
Glossogobius aglestes Koumans, Zool. Meded. Leiden 22, 1940, p. 123 (as synonym).
Glossogobius vaisiganis Koumans, o.c. p. 125 (as synonym).
Glossogobius biocellatus Koumans, Mem. Indian Mus. 13, 1941, p. 255.
Glossogobius biocellatus Schultz, Bull. 180 U.S. Nat. Mus., 1943, p. 231.

D. 1 VI; D. 2 I. 9; A. I. 8; P. 17-19; L.l. 28-32; L.tr. 7-8; Predorsal scales 14-17.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-6$^1/_2$ in length, 6-8 in total length. Head pointed, depressed, 3-3$^1/_4$ in length, 3$^2/_3$-4 in total length. Frontal line straight, on snout a little convex. Eye 4$^1/_3$-5 in head, interorbital $^1/_3$-$^1/_4$ eyediameter. A circular process from upper part of iris into pupil of eye. A crest from snout to temporal region is in interorbital distinct. Snout pointed, as long as eye or a little shorter, tip before middle of eye. Lower jaw prominent. Maxillary extends to below posterior margin of eye. Teeth in many rows, in maxillary some rows caninoid; in lower jaw outer row and inner row caninoid enlarged, outer row strongly curved in front. Three to five longitudinal mucous canals on cheek. One pore in middle of interorbital. Supraopercular groove begins with an open pore behind eye. Head scaled above behind eye and on upper part of opercle with ctenoid scales. First dorsal fin pointed, the second, third and fourth rays are the longest. Second dorsal fin about as high as body. Pectoral fin rounded, about as long as head without snout. Ventral fin not shorted than pectoral fin. Anal fin similar to second dorsal fin. Caudal fin rounded, shorter than head. Colour greenish to blackish. Head with shiny spots on lower part and blackish spots on upper part. On body shiny greenish spots and 5-6 greater blotches in a longitudinal row on upper part or two rows of alternating blotches. Fins blackish to orange. First dorsal fin with a blackish ocellus between first and second ray and another between fifth and sixth ray. Other fins, except ventral fin, with spotted rays. Length 101 mm.

Nom. indig.: Mollon (Mad.), Mangena (Buru).

Habitat: Singapore; Pulu Weh!; Sumatra (Benkulen, Padang, Priaman); Simalur (Lugu!); Nias (Gunung Sitoli!); Java (Djakarta, Dirk de Vries bay!, Tandjung Petjinan!, Batu Ulo); Sumbawa (Bima); Borneo (Sandakan); Celebes (Makassar, Moros, Pompanua, river near Tello!, Paré Paré!); Siau; Buru (Wa' Tina!); Nusa Laut!. — India!, Ceylon, Andamans!, Siam, Indo China, Hongkong, Philippines (Negros!), Fiji, Samoa (Vaisigano river!, Pago Pago, Apia), Paumotu Islands, Queensland. — In sea and estuaries.

Type of *Glossogobius aglestes* and *G. vaisiganus* seen in U.S. Nat. Museum.

2. **Glossogobius giuris** (H. B.) (Fig. 39 and 40, p. 162, 163)

?*Gobius gutum* Hamilton Buchanan, Gangetic Fishes 1822, p. 50.
Gobius giuris Hamilton Buchanan, o.c. pp. 51, 366, pl. 33 fig. 15.
Gobius kokius Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 68.
Gobius giuris Cuvier & Valenciennes, o.c. p. 72.
Gobius Celebius Cuvier & Valenciennes, o.c. p. 74.
Gobius Russelii Cuvier & Valenciennes, o.c. p. 75.
Gobius catebus Cuvier & Valenciennes, o.c. p. 76.
Gobius kora Cuvier & Valenciennes, o.c. p. 77.
Gobius kurpah Sykes, Ann. Mag. Nat. Hist. 4, 1840, p. 55. — Trans. Zool. Soc. London 2, 1841, p. 352, pl. 61 fig. 1.
Gobius fasciato-punctatus Richardson, Voy. Sulphur Ichth. 1844, p. 145, pl. 62 figs. 13, 14.
Gobius phaiosoma Bleeker, Verh. Bat. Gen. 22, 1849, p. 30.
Gobius fusiformis Bleeker, o.c. p. 30.
Gobius phaiospilosoma Bleeker, o.c. p. 30.
Gobius kokius Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1162.
Gobius sublitus Cantor, o.c. p. 1163.
Gobius brunneus Temminck & Schlegel, Fauna Japonica Pisces 1845, pl. 74 fig. 2.
Gobius olivaceus Temminck & Schlegel, o.c. pl. 74 fig. 3.
Gobius platycephalus Peters, Monatsber. Ak. Berlin 1852, p. 681 (not of Rich.?).
Gobius giuris Günther, Fishes 3, 1861, p. 21.
Gobius unicolor (Kuhl & v. Hasselt) Günther, o.c. p. 23 (not of C.V.).
Gobius sublitus Günther, o.c. p. 24.
Gobius spectabilis Günther, o.c. p. 45.
Gobius pavo Steindachner, Sitz. ber. Ak. Wien 55, 1867, p. 715.
Gobius Grandidieri Playfair, Proc. Zool. Soc. London 1868, p. 10.
Gobius obscuripinnis Peters, Monatsber. Ak. Berlin 1868, p. 263.
Gobius olivaceus Bleeker, Versl. Ak. Amsterdam (2) 3, 1869, p. 244.
Gobius sauroides Castelnau, Proc. Linn. Soc. N.S. Wales 3, 1878, p. 48.
?*Gobius gutum* Day, Fishes India 1878, p. 294.

Gobius giuris Day, o.c. p. 294, pl. 66 fig. 1.
?*Gobius suppositus* Sauvage, Bull. Soc. Philom Paris (7) 4, 1880, p. 41.
Gobius Boscii Sauvage, o.c. p. 44.
Gobius circumspectus Macleay, Proc. Linn. Soc. N.S. Wales 8, 1883, p. 267.
Eleotris laticeps De Vis, o.c. 9, 1884, p. 692.
Gobius concavifrons Ramsay & Ogilby, o.c. (2) 1, 1886, p. 12.
?*Gobius gutum* Day, Fauna Brit. India Fishes 2, 1889, p. 265.
Gobius giuris Day, o.c. p. 266.
Gobius giuris Sauvage, Poissons de Madagascar 1891, p. 363, pl. 37 figs. 3, 3a.
Gobius celebius M. Weber, Zool. Ergebnisse 3, 1894, p. 410.
Gobius giuris Reuvens, Notes Leyden Mus. 16, 1894, p. 150.
Rhinogobius circumspectus Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 400.
Gobius giuris M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 260.
Gobius celebius M. Weber, Abh. Senckenb. Naturforsch. Ges. 34, 1911, p. 36.
Gobius celebius M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 600.
Gobius giuris M. Weber, o.c. p. 600.
Gobius javanicus M. Weber, o.c. p. 600 (not of Blkr.) [1]).
Gobius (Glossogobius) giuris M. Weber, Siboga Exp. Fische 1913, p. 468, fig. 93.
Gobius (Glossogobius) celebius M. Weber, o.c. p. 468, fig. 94.
Gobius matanensis M. Weber, Bijdragen Dierkunde 1913, p. 209, fig. 7.
Glossogobius giuris McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 236.
Glossogobius circumspectus Hora, Mem. Asiat. Soc. Bengal 6, 1924, p. 493.
Glossogobius celebius Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 158, pl. 12 fig. 4.
Glossogobius giurus Herre, o.c. p. 161, pl. 27 fig. 1.
Gobius (Glossogobius) giuris Barnard, Ann. South Afric. Mus. 21, 1927, p. 814.
Glossogobius giuris Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 402.
Glossogobius celebius Fowler, o.c. p. 402.
Glossogobius concavifrons Fowler, o.c. p. 404.
Glossogobius vomer Whitley, Rec. Austral. Mus. 17, 1929, p. 135, pl. 32 fig. 1.
?*Gobius gutum* Hora, Mem. Indian Mus. 9 no. 4, 1929, pl. 14 fig. 7.
Gobius (Glossogobius) giuris Wu, Contr. Biol. Lab. Sci. Soc. China 7 Zool. Ser. 1931, p. 41.
Gobius giuris Pellegrin, Mem. de Malgache 14, 1933, p. 134, fig. 74.
?*Gobius gutum* Hora, Rec. Indian Mus. 36, 1934, pp. 484, 486.
Glossogobius suppositus Whitley, Rec. Austral. Mus. 19, 1934, p. 159.
Glossogobius giuris Lin, Lingnan Sci. Journ. 13 no. 4, 1934, p. 687.
Glossogobius giuris Koumans, Zool. Meded. Leiden 18, 1935, p. 148.
Glossogobius koragensis Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 419. — o.c. 21, 1936, p. 459.
Glossogobius giuris Herre, o.c. 21, 1936, p. 458.
Glossogobius giuris brunneus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 88,
Glossogobius celebius Herre, o.c. 21, 1936, p. 458.
fig. 35.

---

1) The specimen from a small river near Lorentz river on New Guinea proved to belong to *Glossogobius giurus* (H.B.).

Glossogobius giuris giuris Tomiyama, o.c. p. 88, fig. 36.
Glossogobius giuris Koumans, Zool. Meded. Leiden 19, 1937, p. 178. — Mem. Indian Mus. 13, 1941, p. 256.
Glossogobius concavifrons Whitley, Rec. Austral. Mus. 20, 1938, p. 233.
Glossogobius giuris Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 144, fig. 13g.
Glossogobius celebius Aurich, o.c. p. 146.
Glossogobius intermedius Aurich, o.c. p. 147, fig. 14.
Glossogobius matanensis Aurich, o.c. p. 148, fig. 13 m.
?*Stupidogobius flavipinnis* Aurich, o.c. p. 149, fig. 15.
Glossogobius koragensis Koumans, Zool. Meded. Leiden 22, 1940, p. 138 (as synonym).
Glossogobius circumspectus Koumans, o.c. p. 163 (as synonym).
Glossogobius concavifrons Koumans, o.c. p. 163 (as synonym).
Glossogobius vomer Koumans, o.c. p. 168 (as synonym).
Eleotris laticeps Koumans, o.c. p. 175 (as synonym).

D. 1 VI; D. 2 I. 8-9; A. I. 7-8; P. 17-21; L.l. 28-36; L.tr. 8-14; Predorsal scales 12-30.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-6$^1/_4$ in length, 6-8$^1/_2$ in total length. Head pointed, depressed, 3-3$^3/_4$ in length, 3$^3/_4$-4$^1/_4$ in total length. Profile straight to a little convex. Eye 4-8 in head, interorbital $^1/_3$-1 eyediameter. On each side of interorbital space a low crest. Snout pointed, convex; in young specimens shorter than eye, in adult longer than eye. Tip of snout before middle or lower part of eye. Lower jaw prominent. Maxillary extends to below anterior part of eye, or only to anterior border of eye. Lips thick. Teeth of outer and inner row enlarged, in front caninoid. Tongue bilobate. Some (3-5) longitudinal mucous canals on cheek. Head scaled above behind the eyes and on upper part of opercle, upper part of cheek sometimes scaled. Scales of head nearly all cycloid, of breast and belly cycloid, other scales ctenoid. Dorsal fins close together. First dorsal fin lower than body, second, third and fourth rays are the longest, sometimes filiform. Second dorsal and anal fin pointed posteriorly. Pectoral fin as long as or longer than head without snout. Ventral fin obtuse, a little shorter than pectoral fin. Caudal fin obtuse to oblong, about as long as head. Colour olive green to blackish green above, lighter below. Head laterally with irregular dark to violet spots. Laterally on body two alternating longitudinal rows, each of 4-6 dark blotches, which disappear sometimes in large specimens. Fins yellowish green. The rays of dorsal fins, caudal and pectoral fin are spotted with dark spots. First dorsal fin sometimes with dark spot posteriorly. Anal fin sometimes with black margin. Pectoral fin with dark spot above on base. Ventral fin sometimes dusky. Length 350 mm.

Nom. indig.: Ikan Bobossok (Mal. Djakarta), Ikan Bloso (Jav. Semarang), Ikan Tonguloba (Madur, Bangkallang), Ikan Djambudur, Ikan Kodjol (Madur. Sumanep), Larodon (Tapeh, Simalur), Ka-semum (New Guinea), Tambal usu (Palembang), Bossok, Njerreh, Bluso (Jav.), Bonto, Bontini, Agori, Bungi (Celebes), Belosso (Mal.), Lamutjong (Jav.), Båså (Jav.), Blonguran (Sarawak), Belunguran majang (Samarinda).

Habitat: Known from all parts of the Indo-Australian Archipelago, where it is abundant. — East coast of Africa, India, Andamans, Malay Peninsula, Siam, China, Japan, Philippines, Australia and the South Pacific Islands. — In sea and rivers.

Type of *Gobius unicolor* Kuhl & v. Hasselt (not of C.V.) seen in the Leiden Museum, types of *Gobius matanensis* seen in the Amsterdam Museum, type of *Gobius fasciato-punctatus,* type of *Gobius spectabilis,* type of *Gobius sublitus* seen in British Museum (N.H.), type of *Gobius boscii* seen in Paris Museum, type of *Glossogobius koragensis* seen in Field Museum Nat. Hist. Chicago, holotype of *Gobius concavifrons,* holotype of *Gobius circumspectus,* type of *Glossogobius vomer* seen in Australian Museum, Sydney, type of *Eleotris laticeps* seen in Queensland Museum, Brisbane.

Note: The described species *Gobius giuris, matanensis* and *celebius* are regarded as varieties of *Glossogobius giuris,* based on characters, which are present in extreme forms, but there are a number of specimens of which it is impossible to decide to which variety they belong, in the case one has a large material at hand. The described species by Aurich are based on very small variations. Aurich does not state how many specimens he studied, which is of interest in such cases. In studying a large number of hundreds of specimens, Koumans came to the conclusion which he stated in Zool. Meded. Leiden 18, 1935, p. 145-150.

30. **Gnatholepis** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 318)

Hazeus Jordan & Snyder, Proc. U.S. Nat. Mus. 24, 1902, p. 51.
Isthmogobius Bleeker (Museum name in Leiden Museum).

Body elongate, compressed, covered with 24-32 ctenoid scales, more cycloid, but large, on neck. Head compressed, scaled above behind the eyes, and on cheek and opercle with large, cycloid scales. Eye large, bony interorbital narrow. Snout short. Anterior nostril in a short tube. Mouth oblique, upper jaw or lower jaw prominent. Teeth in some rows, outer row enlarged, sometimes in lower jaw on each side of outer row a caninoid tooth. Tongue truncate to scarcely bilobate. Gillopenings far continued forward below, isthmus narrow. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 8-11; A. I. 8-11. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin obtuse to rounded.

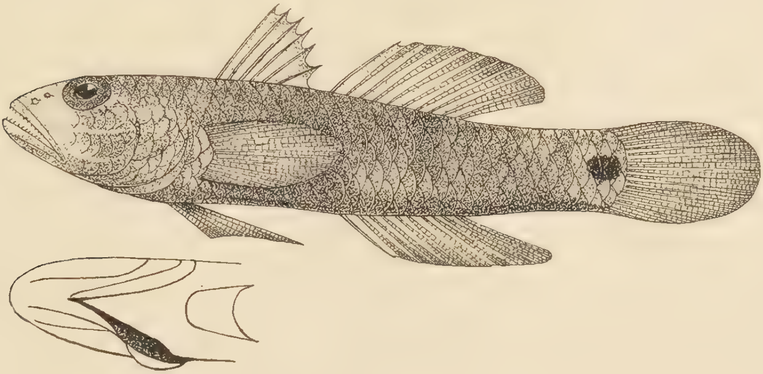

Fig. 41. *Gnatholepis baliurus* (C.V.) × 1½.

Distribution: Siam, Indo China, Japan, Philippines, Indo-Australian Archipelago.

Key to the Indo-Australian species of Gnatholepis

1. Two longitudinal mucous canals running between three rows of scales on cheek. L.tr. 7-8. D. 2 I. 9-10; A. I. 9. . . . . 1. *G. baliurus* p. 169.
2. A longitudinal mucous canal running below the upper row of scales on cheek L.tr. 10. D. 2 I. 10; A. I. 9. . . . . 2. *G. calliurus* p. 170.
3. No longitudinal mucous canal on cheek. D. 2 I. 12; A. I. 12 . . . . 3. *G. anjerensis* p. 171.

1. **Gnatholepis baliurus** (C.V.) (Fig. 41, p. 169)

Gobius baliurus (Kuhl & v. Hasselt) Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 61.

Gobius baliurus Bleeker, Verh. Bat. Gen. 22, 1849, p. 31.
Gobius baliurus Günther, Cat. Fishes 3, 1861, p. 18.
Gobius baliurus M. Weber, Siboga Exp. Fische 1913, p. 465.

D. 1 VI; D. 2 I. 9-10; A. I. 9; P. 18; L.l. 28; L.tr. 7-8; Predorsal scales 8-9.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-5$^1/_2$ in length, 6-7 in total length. Head compressed, 3$^1/_4$-3$^1/_2$ in length, 4$^1/_5$-4$^1/_2$ in total length. Profile convex. Eye 3-4 in head, interorbital $^1/_3$ eyediameter. Snout convex, shorter than eye, tip before lower part of eye. Mouth oblique, lower jaw a little prominent. Maxillary extends to below anterior part of eye or to middle of eye. Teeth of outer row enlarged. Tongue obtuse. Gill-openings far continued forward below, isthmus narrow. Short mucous canals radiate under eye, two longitudinal rows on cheek, running between three longitudinal rows of scales. Interorbital with an open pore, open pore in supraopercular groove. Head scaled above behind the eyes and on cheek and opercle with large cycloid scales. Scales of nape, breast and belly cycloid, other scales ctenoid. First dorsal fin lower than body, anterior rays are the longest. Second dorsal fin and anal fin higher than first dorsal fin, about as high as body. Pectoral fin obtuse, about as long as head. Ventral fin obtusely rounded, not shorter than head without snout. Caudal fin obtuse, about as long as head. Colour of upper parts reddish green to olive, lower parts greenish. Laterally 3-4 dark dots in a longitudinal line. Fins yellowish. Rays of second dorsal and caudal fin spotted. In middle of base of caudal fin a round blackish dot. Length 95 mm.

Habitat: Singapore; Java Sea!; Java (Djakarta!); Sumbawa (Bima!); Celebes (Makassar); Saleyer!; Ambon. — In sea.
Specimen from Java, Kuhl & v. Hasselt, the type?, seen in Paris Museum.

Note: The specimen no. 1895, Leiden Museum, *Gobius baliurus* Kuhl & v. Hasselt, Java belongs to *Awaous stamineus* (Val.). The specimens of Bleeker's collection in the Leiden Museum bear the label: *Isthmogobius baliurus.*

2. **Gnatholepis calliurus** Jordan & Seale

Gnatholepis calliurus Jordan & Seale, Proc. U.S. Nat. Mus. 28, 1905, p. 796, fig. 14.
Gnatholepis calliurus Chabanaud, Bull. Mus. Hist. Nat. Paris 29, 1923, p. 559.

Gnatholepis calliurus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 130, pl. 9 fig. 2.
Gnatholepis calliurus Koumans, Zool. Meded. Leiden 22, 1940, p. 123.

D. 1 VI; D. 2 I. 10; A. I. 9; P. 16-18; L.l. 28-30; L.tr. 10; Predorsal scales 9-10.

Body compressed, height $4^1/_2$-5 in length. Head compressed, 3-$3^1/_4$ in length. Profile convex. Eye $3^1/_2$-4 in head, interorbital very narrow. Snout obtuse, about 4 in head, tip before inferior margin of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below middle of eye. Teeth in 4 rows in each jaw, outer row enlarged. Tongue rounded. A longitudinal mucous canal on cheek, below the upper row of scales. Some short vertical mucous canals under and behind eye. Head scaled above behind eye. Cheek with 3 longitudinal rows of scales. Opercle scaled above. Scales of head, nape and breast cycloid, of body ctenoid. First dorsal fin lower than body, second ray is the longest. Second dorsal and anal fin as high as body. Caudal fin rounded to truncate, shorter than head. Colour in spirits brown above, lighter below. A whitish spot in centre of each brown scale. A large blackish spot on base of caudal fin and 4 similar, but paler spots along middle of the side; these spots are sometimes connected by a blackish line. On opercle in front of pectoral fin a large dusky, iridescent silver spot. Upper part of eye covered by a blackish band. Dorsal fins and anal fin with minute dark brown spots. Caudal fin dusky with several white crossbands. Ventral and pectoral fin with dusky spots, central part of ventral fin may be blackish. Base of pectoral fin with dark spot on upper part. Length 90 mm.

Habitat: Singapore; Nias (Labewa!); Borneo (Sandakan); East Indian Archipelago! (coll. Bleeker). — Gulf of Siam, Tonkin, Philippines (Negros!).

Type of *Gnatholepis calliurus* seen in U.S. Nat. Museum.

3. **Gnatholepis anjerensis** (Blkr.)

Gobius anjerensis Bleeker, Nat. Tijdschr. Ned. Indië 1, 1850, p. 251, fig. 11.

D. 1 VI; D. 2 I. 12; A. I. 12; P. 18?; L.l. ± 26.

Body elongate, height a little more than 5 in total length. Head obtuse, convex $4^1/_2$ in total length. Eye 4 in head. Snout convex. Jaws equal. Teeth small, equal, no canines. Mouth oblique, maxillary extends to before eye. Cheek and opercle scaled. Dorsal fins close together, lower than body. First dorsal fin rounded, anterior rays are the longest. Second dorsal fin pointed posteriorly. Pectoral fin rounded, shorter than head and a little shorter than ventral fin. Anal fin lower than second dorsal fin. Caudal fin oblong, $4^1/_2$ in total length. Colour ?. Length of the uncoloured figure of Kuhl & v. Hasselt 48 mm.

Habitat: Java (Anjer).

Note: The description by Bleeker was made after a figure, therefore no type specimen exists. It is not impossible that this described species proves to be *Acentrogobius cauerensis* (Blkr.).

31. **Weberogobius** nov. gen.

Body elongate, compressed, covered with 60-65 scales, ctenoid posteriorly, cycloid anteriorly. Nape scaled. Head scaled above behind the eyes and on opercle with small cycloid scales. Interorbital more than eye. Snout longer than eye. Mouth oblique, lower jaw prominent. Teeth in many rows, outer and inner row enlarged, no canines. Tongue a little pointed. Two curved mucous canals on cheek. Gillopenings continued forward below, isthmus very narrow. Inner edge of shouldergirdle without fleshy flaps. First dorsal fin with 6 rays. D. 2 I. 10; A. I. 10. Pectoral fin without free silklike rays. Caudal fin rounded, shorter than head.

Type of the genus: *Gobius amadi* M. Weber.

Distribution: Freshwater of Celebes.

1. **Weberogobius amadi** (M. Weber) (Fig. 42, p. 173)

Gobius amadi M. Weber, Bijdragen Dierkunde 1913, p. 211, fig. 8.

D 1 VI; D. 2 I. 10; A. I. 10; P. 19; L.l. 60-65; L.tr. 18-19; Predorsal scales 28-30.

Body elongate, compressed, height $4^1/_2$ in length, $5^1/_4$ in total length. Head subcylindrical to a little compressed, flat above, $2^1/_2$-$2^3/_4$ in length, $3^1/_4$ in total length. Eye 6-$6^1/_2$ in head, interorbital $1^1/_2$ eyediameter. Snout convex, $1^1/_2$ eyediameter, tip before middle of eye. Mouth oblique, lower jaw a little prominent. Maxillary extends to below anterior half of eye. Teeth in both jaws in many rows, outer and inner row enlarged. No canines. Tongue a

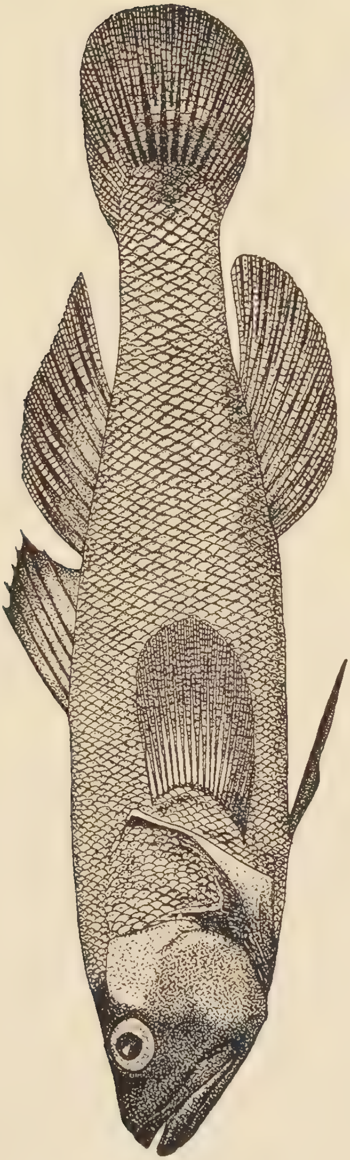

Fig. 42. *Weberogobius amadi* (M. Weber). n.s. After M. Weber.

little pointed. Two short, curved mucous canals on cheek. Gillopenings continued forward below, isthmus very narrow. Scales of body posteriorly feebly ctenoid, anteriorly cycloid. First dorsal fin lower than body. Second dorsal and anal fin as high as first dorsal fin. Caudal fin obtusely rounded, shorter than head. Pectoral fin as long as postorbital part of head. Ventral fin a little shorter. Colour brown, naked part of head and the fins black. Length 145 mm.

Habitat: Celebes (Posso lake!). — In freshwater.

Types seen in the Amsterdam Museum.

Note: This species belongs to a new genus, it does not belong to *Glossogobius,* as suggested by M. Weber, neither it belongs to *Tamanka.* From *Glossogobius* it is at once distinguished by the absence of canines, besides in other characters. From *Tamanka* it is distinguished by the narrow isthmus and the higher number of finrays in second dorsal and anal fin.

32. **Cottogobius** Koumans

(Koumans, Mem. Indian Mus. 13, 1941, p. 253)

Body elongate, anteriorly cylindrical, posteriorly compressed, covered with 26-27 ctenoid scales. Head depressed to subcylindrical, naked or scaled above behind the eyes with ctenoid scales. Interorbital narrow. Snout pointed, as long as eye or longer than eye. Anterior nostril tubular. Mouth a little oblique. Jaws subequal or upper jaw prominent. Teeth in both jaws in several rows; in upper jaw row enlarged, caninoid; in lower jaw outer row enlarged, inner row laterally caninoid, on each side of symphysis of lower jaw 1-2 strong, curved canines. Tongue bilobate. Some longitudinal mucous canals on cheek. Some open pores round upper half of eye and along posterior margin of preopercle. Gillopenings continued forward below, gillmembranes united across the isthmus. No fleshy flaps on inner edge of shouldergirdle. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 7-8; A. I. 7-8. Ventral fins united, short, basal membrane with a lobe on each side. Pectoral fin without free silklike rays, undermost rays are unbranched and a little bent outward. Caudal fin obtuse, much shorter than head.

Distribution: India, Nicobars, Celebes, Sulu Islands.

Note: This genus is very remarkable in having the undermost rays of pectoral fin undivided. In this respect the fin has some resemblance to the pectoral fin of Cottoid fishes. Another remarkable character is the uniting of the gillmembranes across the isthmus.

1. **Cottogobius bilobatus** Koumans (Fig. 43, p. 175)

Cottogobius bilobatus Koumans, Mem. Indian Mus. 13, 1941, p. 253.

D. 1 VI; D. 2 I. 7-8; A. I. 7-8; P. 16-18; L.l. 26-27; L.tr. 6-7; Predorsal scales about 10 or absent.

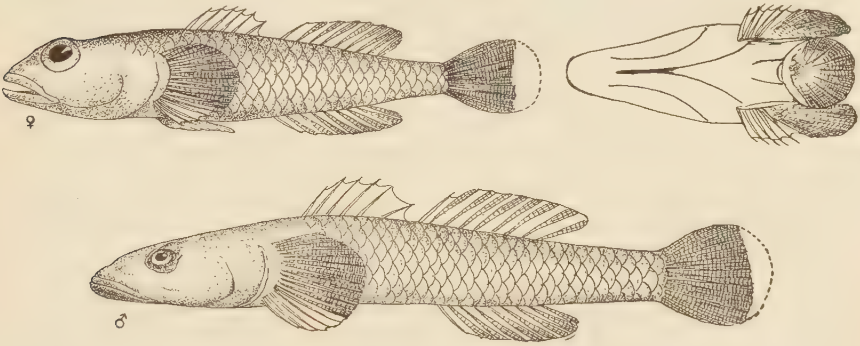

Fig. 43. *Cottogobius bilobatus* Koumans. × 3.

Body elongate, anteriorly cylindrical, posteriorly compressed, height ($4^{1}/_{2}$) 6 in length, 7 in total length. Head depressed (to subcylindrical), (3) $3^{1}/_{4}$ in length, $3^{3}/_{4}$ in total length. Eye ($3^{1}/_{2}$) 4 in head, interorbital $^{1}/_{5}$ eyediameter. Snout pointed, (as long as eye) $1^{1}/_{2}$ eyediameter, tip before lower part of eye. Anterior nostril tubular. Mouth a little oblique, upper jaw prominent (jaws subequal). Maxillary extends to below anterior margin of pupil. Lips thick. Teeth in upper jaw in many rows of small teeth, outer row enlarged, canines. In lower jaw teeth in many rows, outer row enlarged, inner row laterally enlarged to curved canines; on each side of symphysis of lower jaw 1-2 strong, curved canines. Tongue bilobate. Two to three longitudinal mucous canals on cheek. Some open pores round the upper half of eye and along posterior margin of preopercle. Gillopenings far continued forward below, gillmembranes united in front across the isthmus. No fleshy flaps on inner edge of shouldergirdle. Head, nape and breast naked (head scaled above behind eye with ctenoid scales). Scales of body ctenoid. Dorsal fins separate. First dorsal fin lower than body, middle rays are the longest. Caudal fin obtuse, much shorter than head. Pectoral fin broad, $^1/_2$ of head, without free silklike rays, lowermost rays are unbranched and a little bent outward. Ventral fin short, as long as postorbital part of head, united, about circular, the outer margin is fringed as the rays extend a little beyond the membrane; basal membrane well developed, laterally with a rounded lobe (lobe bilobate). Colour in spirits brownish. On head 3 faint darker bands, radiating from eye, one on snout, extending on upper lip, where it meets the band of the other side, one to end of maxillary, one on cheek. Body wholly with minute dark spots. First dorsal fin with a few dark spots. Second dorsal fin with more spots, forming at the last ray a black irregular blotch. Middle of caudal fin dark. Anal fin diaphanous. Pectoral fin diaphanous, base with many minute spots. Ventral fin diaphanous. (Colour fainter. No blotch on second dorsal fin. Lower half of caudal fin dark). Length 27 mm.

In some specimens, of which I have stated the characters in parenthesis, and which I regard to be females, I found the predorsal region sometimes scaled. In the specimens, which I regard to be males, I found the predorsal region naked. So this and other slight differences between the two groups, I regard to be due to sexual dimorphism.

Habitat: Sulu Islands (Sipankot!); Celebes (Mamudju!). — India!; Nicobars!.

Type and cotypes seen in the Indian Museum, Calcutta, cotypes seen in the Leiden Museum.

33. **Ctenogobius** Gill

(Gill, Annals Lyceum Nat. Hist. New York 6, 1858, pp. 374, 430)

Amoya Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 225.
Yongeichthys Whitley, Rep. Brit. Mus. (N.H.) 4 no. 9, 1932, p. 302.

Body elongate, compressed, covered with 25-? 50 ctenoid scales; those of the anterior part of body and on breast and belly cycloid. Head obtuse, nearly entirely naked, only behind each eye a longitudinal band of scales. Neck naked, except some scales close before the insertion of first dorsal fin. Bony interorbital somewhat less than $^1/_2$ eyediameter, in young specimens much narrower. Snout obtuse, about as long as eye. Anterior nostril in a short tube. Mouth oblique, jaws subequal. Teeth in both jaws in many rows, the outer of which is enlarged. The outer row in lower jaw extends to halfway the jaw, last teeth caniniform. According to Gill, the presence of canine teeth is a sexual character. Tongue truncate to emarginate. Cheek and opercle entirely naked. Gillopenings not very wide, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 I. 7-12; A. I. 7-11. Ventral fins united, oblong. Pectoral fin with or without free silklike rays, base scaled. Caudal fin obtuse to pointed.

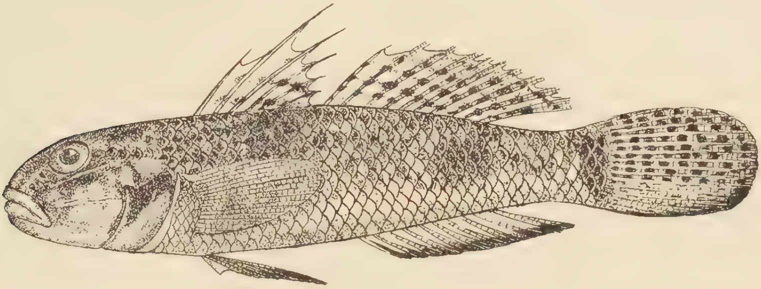

Fig. 44. *Ctenogobius criniger* (C.V.). × 3/4.

Distribution: Red Sea to the Pacific.

Note: Specimens of *Acentrogobius reichei* (Blkr.) have sometimes a great resemblance to this genus, as the predorsal scales in that species fall out readily, therefore this species is named in the following key.

Key to the Indo-Australian species of Ctenogobius

1. Head compressed.
   A. L.l. 36; L.tr. 10-11. Caudal fin longer than head . . . . 1. *C. gracilis* p. 178.
   B. L.l. 30-32. Caudal fin obtuse.
      a. L.tr. 11-12. Sides with large brown dots . . . . 2. *C. criniger* p. 178.
      b. L.tr. 8 Belly with purple transverse streaks . . . . 3. *C. grammatogaster* p. 180.
   C. L.l. ± 26; L.tr. 7-8. Body with 12-14 transverse bands . . . . 4. *C. notophthalmus* p. 181.
2. Head subcylindrical to feebly compressed. L.l. ± 28; L.tr. 8. Head and body with shiny spots . . . . 5. *C. cylindricus* p. 182.
(3. Head depressed . . . . *Gobius reichei* Blkr. belongs to *Acentrogobius*)

1. **Ctenogobius gracilis** Bleeker

Ctenogobius gracilis Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 127.

D. 1 VI; D. 2 I. 10-11; A. I. 9; L.l. 36; L.tr. 10-11.

Body elongate, anteriorly a little compressed, posteriorly compressed, height $5^{1}/_{3}$-$5^{2}/_{3}$ in length, 7-$7^{1}/_{2}$ in total length. Head a little compressed, obtuse, 4-$4^{1}/_{2}$ in length, $5^{1}/_{2}$-$6^{1}/_{3}$ in total length. Profile convex. Eye $3^{1}/_{2}$-4 in head, interorbital less than $^{1}/_{3}$ eye-diameter. Snout obtuse, shorter than eye, tip below inferior margin of eye. Mouth a little oblique, lower jaw a little prominent. Maxillary extends to below middle of eye. Teeth in several rows, outer row enlarged. In upper jaw on each side in front four to five enlarged teeth, in lower jaw on each side a recurved canine. Longitudinal mucous canals on cheek. Supraopercular groove distinct, with an open pore behind eye. In interorbital in front an open pore medially. Median part of nape and breast naked. Scales of body ctenoid, on throat, belly and anteriorly on the sides cycloid. First dorsal fin pointed, second and third rays are the longest, sometimes prolonged in short filaments. Second dorsal and anal fin in front lower than body, posteriorly pointed. Pectoral fin obtuse, a little longer than head. Ventral fin pointed, a little shorter than head. Caudal fin in young specimens obtuse, in adult more pointed and longer than head. Colour reddish green above, lighter below. Fins reddish yellow? Anteriorly on opercle a violet to dusky blotch. On caudal peduncle a row of 3-5 dusky spots in a longitudinal line, the last one before base of caudal fin. Caudal fin in basal half with small dusky spots in 4-5 irregular transversal rows, in posterior half with dusky spots in longitudinal rows. First dorsal fin behind with an oblique dusky stripe. Second dorsal fin behind with dusky spot. Anal fin dusky behind. Length 75 mm.

Habitat: Singapore!.

Type seen in the Leiden Museum.

2. **Ctenogobius criniger** (C.V.) (Fig. 44, p. 177)

?*Gobius nebulosus* Forskål, Descrip. anim. 1775, p. 24.
?*Gobius nebulosus* Bloch ed. Schneider, Syst. Ichth. 1801, p. 72.
Gobius criniger Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 82.
?*Gobius nebulosus* Cuvier & Valenciennes, o.c. p. 84.
Gobius brevifilis Cuvier & Valenciennes o.c. p. 90.
Gobius criniger Richardson, Zool. Erebus & Terror, 1844, p. 2, pl. 1 figs. 3, 4.

Gobius criniger Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1166.
Gobius criniger Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 453.
Gobius criniger Günther, Cat. Fishes 3, 1861, p. 29.
Gobius criniger Day, Fishes Malabar 1865, p. 111.
Gobius caninus var. *africana* Playfair, Fishes Zanzibar 1866, p. 71, pl. 9 fig. 1 (not of C.V.).
?*Gobius petersenii* Steindachner, Verh. zool. bot. Ges. Wien 16, 1866, p. 781, pl. 18 fig. 17.
Gobius caninus var. *africana* Steindachner, Sitz. ber. Ak. Wien 56, 1867, p. 313 (not of C.V.).
Gobius brevifilis Day, Proc. Zool. Soc. London 1867, p. 940.
Gobius brevifilis Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 176, pl. 108 fig. G.
Gobius criniger Day, Fishes India 1878, p. 288, pl. 62 fig. 2.
Gobius festivus De Vis, Proc. Linn. Soc. N.S. Wales 9, 1884, p. 687.
Gobius criniger Day, Fauna Brit. India Fishes 2, 1889, p. 255.
Gobius brevifilis Sauvage, Poissons de Madagascar 1891, p. 359, pl. 41 fig. 2.
Rhinogobius nebulosus Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 401.
Rhinogobius nebulosus Jordan & Seale, o.c. 26, (1906) 1907, p. 41.
Rhinogobius lungi Jordan & Seale, o.c. p. 41, fig. 13.
Rhinogobius nebulosus Jordan & Richardson, o.c. 27, (1907) 1908, p. 276.
Rhinogobius nebulosus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 245.
Rhinogobius criniger Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 191, pl. 14 fig. 2.
Rhinogobius nebulosus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 410.
Yongeichthys criniger Whitley, Rep. Brit. Mus (N.H.) 4 no. 9, 1932, p. 303.
Gobius criniger Pellegrin, Mem. Ac. Malgache 14, 1933, p. 144, fig. 82.
Rhinogobius nebulosus Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 82, fig. 23.
Rhinogobius baliuroides Fowler, o.c. p. 82, fig. 127 (not of Blkr.).
Gobius nebulosus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 67.
Rhinogobius lungi Koumans, Zool. Meded. Leiden 22, 1940, pp. 126, 145 (as synonym).
Gobius festivus Koumans, o.c. p. 175 (as synonym).
Ctenogobius criniger Koumans, Mem. Indian Mus. 13, 1941, p. 265.

D. 1 VI; D. 2 I. 9; A. I. 9; P. 17-19; L.l. 30-32; L.tr. 11-12; Predorsal scales 2-3.

Body elongate, compressed, height 4-5 in length, 5-6 in total length. Head compressed, obtuse convex, $3^1/_3$-$3^2/_3$ in length, $4^1/_4$-$4^3/_4$ in total length. Profile convex. Eye 3-$3^2/_3$ in head, interorbital $^1/_2$ eyediameter. Anterior nostril in a short tube. Snout obtuse, shorter than eye to equal to eye, tip below inferior margin of eye. Mouth oblique. Jaws equal. Maxillary extends to before pupil. Teeth in lower jaw on each side a curved canine. Mucous canals in longitudinal rows on cheek. In interorbital medially in front an open pore. Supraopercular groove with distinct open pores. Scales on nape cycloid. Scales of back, sides and belly ctenoid. Dorsal fins separate. First dorsal fin pointed, second and third rays are the longest, filiform. Second dorsal fin much lower than body, pointed posteriorly. Anal fin much lower and shorter than second dorsal fin. Pectoral fin obtusely rounded, with or without free silklike rays. Caudal fin obtusely rounded, shorter than head. Colour olivous to orange green above, orange to pearl coloured below. Head and dorsal part of body with irregular blackish spots. Three larger blackish spots, the first below first dorsal fin, the second below second dorsal fin, the third at middle of base of caudal fin. Fins yellowish. Second dorsal fin with 4 rows of blackish spots. First dorsal fin with 3 rows of blackish spots. Caudal fin on upper part with blackish spots in transversal rows. Caudal and anal fin with blackish border. Length 126 mm.

Nom. indig.: Bilir (Sundan.), Njòhò (Tjilatjap).

Habitat: Singapore; Banka; Sumatra!, (Benkulen); Java (Bantam, Bay of Djakarta!, Surabaja!, Tjilitjap!); Madura (Pamekasan!); Bali (Den Pasar!); Timor!; Borneo (Sandakan); Sulu Islands (Jolo); Celebes (Makassar!, Badjoa, Menado, river Tello!, Tanette!); Siau!; Ternate; Obi major (Laiwui!); Ambon; Kei Islands (Tual!); Aru Islands; New Guinea (Doreh!). — Mozambique (Inhaca Island!), Zanzibar, Madagascar!, Red Sea!, India!, Andamans!, Siam, Penang, Tonkin, Riu Kiu Islands, Philippines!, New Hebrides, Pelew Islands, Raiatea, Samoa, Northeast Australia (Port Bowen!, Port Jackson!, Port Darwin, Palmerston!, Cape York!). — In sea.

Type of *Gobius criniger* and types of *Gobius brevifilis* seen in Paris Museum, type of *Rhinogobius lungi* seen in U.S. Nat. Museum, cotype seen in Stanford University, types of *Gobius festivus* seen in Queensland Museum, Brisbane.

Note: A specimen from Port Bowen has L.tr. about 10, a specimen from Port Jackson D. 2 I. 10; A. I. 10; L.tr. about 10.

3. **Ctenogobius grammatogaster** Blkr.

Ctenogobius grammatogaster Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 124.

Rhinogobius suluensis Herre, Monogr. 23, Bur. Sci. Manila 1927, p. 193 (pro parte).

Rhinogobius multifasciatus Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 82 (not of Herre).

D. 1 VI; D. 2 I. 9; A. I. 9; P. 16; L.l. ± 30; L.tr. 8.

Body elongate, anteriorly a little compressed, posteriorly compressed, height $4^1/_2$-5 in length, $5^2/_3$-6 in total length. Head obtuse, compressed, 4 in length, 5 in total length. Profile convex. Eye more than 3 in head, interorbital less than $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip below inferior margin of eye. Mouth a little oblique, lower jaw a little prominent. Maxillary extends to below anterior part of pupil. Teeth in several rows; in upper jaw in front some caninoid teeth; in lower jaw on each side a recurved canine. Longitudinal mucous canals on cheek. Supraopercular groove with an open pore behind eye. In front in interorbital medially a small pore. Nape and breast naked. Scales of throat and belly cycloid, on body ctenoid. First dorsal fin lower than body, obtuse, middle rays are the longest, but not prolonged. Second dorsal and anal fin obtuse posteriorly. Pectoral fin obtuse, a little shorter than head. Ventral fin pointed. Caudal fin obtuse, about as long as head. Colour reddish green?. A dusky band from eye to maxillary. Eight purple transverse streaks from middle of side downward, the first to axil of ventral fins, the last to foremost rays of anal fin. Base and middle of ventral fins white, near the margin violet, rest of the fin reddish to yellowish. First dorsal fin posteriorly with dusky blotch. Second dorsal and anal fin dusky. Caudal fin with transversal rows of dusky spots. Length 53 mm.

Habitat: Singapore!; Bali (Den Pasar!); Sulu Islands (Bungau!); Aru Islands (Manumbai!). — In sea.

Types seen in the Leiden Museum.

4. **Ctenogobius notophthalmus** Blkr.

Ctenogobius notophthalmus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 126.
Rhinogobius multifasciatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 190, pl. 14 fig. 1.
Rhinogobius multifasciatus Koumans, Zool. Meded. Leiden 22, 1940, p. 187 (as synonym).

D. 1 VI; D. 2 I. 9; A. I. 9; P. 16; L.l. ± 26; L.tr. 7-8.

Body elongate, compressed, height $5^1/_3$-$5^2/_3$ in length, 7-$7^1/_3$ in total length. Head obtuse, compressed, $3^2/_3$-4 in length, 5-$5^1/_3$ in total length. Profile convex. Eye $3^1/_3$-$3^1/_2$ in head, interorbital less than $^1/_3$ eyediameter. Snout obtuse, shorter than eye, tip before lower part of eye. Mouth a little oblique. Lower jaw a little prominent. Maxillary extends to below anterior half of eye. Teeth in several rows; in upper jaw on each side in front 3-4 caninoid teeth; in lower jaw on each side a recurved canine. Longitudinal mucous canals on cheek. Supraopercular groove with an open pore behind eye. In front in interorbital space medially a distinct open pore. Nape and throat naked. Scales of belly probably cycloid, on body ctenoid. First dorsal fin pointed, middle rays are the longest, but not or nearly not prolonged beyond the membrane. Second dorsal fin lower than body, pointed posteriorly. Pectoral fin rounded, a little shorter than head. Ventral fin pointed, about as long as pectoral fin. Caudal fin oblong, longer than head. Colour reddish green?, fins yellowish to reddish? Body with 12-14 transverse, probably purple, streaks. First dorsal fin posteriorly with black blotch. Second dorsal fin dusky above or with rows of dusky spots. Rays of caudal fin spotted, base with dusky to purple cross streak. Length 71 mm.

Habitat: Singapore; Borneo (Balikpapan!); Ambon. — Philippines (Iloilo!). — In sea.

Types of *Ctenogobius notophthalmus* seen in the Leiden Museum, type of *Rhinogobius multifasciatus* seen in Bureau of Science. Manila.

5. **Ctenogobius cylindricus** Blkr.

Ctenogobius cylindricus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 129.
Rhinogobius nebulosus Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 82 (not of Forskål).

D. 1 VI; D. 2 I. 8; A. I. 8; P. 16; L.l. ± 28; L.tr. 8; Predorsal scales ± 3.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 6 in length, $7^1/_2$ in total length. Head cylindrical or only a little compressed, obtusely convex, 4 in length, about 5 in total length. Dorsal profile convex. Eye $3^1/_2$ in head, interorbital $^1/_3$ eyediameter. Snout obtuse, a little shorter than eye, tip before inferior part of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below anterior margin of eye. Teeth in several rows, outer enlarged. In lower jaw on each side a recurved canine. Tongue truncate. Two longitudinal mucous canals on cheek, one obliquely upward below eye. Anteriorly in median line in interorbital space an open pore, some pores along supraopercular groove, the first behind the eye. Some open pores along posterior margin of preopercle. Head and median part of nape naked, except close before insertion of first dorsal fin. Scales of body ctenoid, on breast and belly cycloid. Dorsal fins subcontinuous. First dorsal fin not lower than body, second and third rays are the longest, second ray filiform in male. Second dorsal and anal fin anteriorly lower than body, posteriorly higher, pointed. Pectoral fin without free rays, shorter than head. Ventral fin oblong, as long as pectoral fin. Caudal fin obtuse, a little shorter than head. Colour reddish green. Head and sides with many shiny spots. Fins yellowish to reddish. In male a dark longitudinal band halfway first dorsal fin. Second dorsal and anal fin in both sexes with dark spots. In female first dorsal fin with dark spots. Ventral fin dark. Caudal fin spotted on base, or larger spot in middle of base of caudal fin. Length 70 mm.

Habitat: Singapore!; Bali (Den Pasar!). — In sea.

Types seen in the Leiden Museum.

Note: Three specimens from Zanzibar, Playfair, in British Museum (N.H.) (239) 69. 1. 29. 54-55, show: D. 1 VI; D. 2 I. 9; A. I. 9; P. 16?; L.l. 29; L.tr. 8. Height 5 in length, $6^1/_2$ in total length. Head 4 in length, 5 in total length, subcylindrical. Colour brownish. Ventral fin with dark tip. First dorsal fin with longitudinal dark band halfway, sometimes a second one near tip. Second dorsal and anal fin with minute dark spots between the finrays. In second dorsal fin the minute spots are sometimes intermixed with larger oblique ones. Caudal fin spotted. Many pearl like spots on head and body. A row of large dark spots in middle of the sides, the last close before caudal fin. Further they agree with *Ctenogobius cylindricus*.

Ctenogobius opalescens Herre, Bull. Raffles Mus. 12, 1936, p. 15, pl. 11 from a reef at Singapore is very close to, perhaps identical with *C. cylindricus*.

34. **Bathygobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 13, 1878, p. 54)

Mapo Smitt, Öfv. Kon. Ak. Förhandlinger Stockholm, 1899, p. 551.
Chlamydes Jenkins, Bull. U.S. Fish Comm. 22, (1902) 1904, p. 503.

Body elongate, anteriorly subcylindrical, posteriorly compressed, covered with 30-43 scales. Neck covered with moderate scales, longitudinal groove in median line more or less developed. Breast scaled. Head depressed, scaled above behind the eyes, cheek scaled or naked, opercle more or less scaled or naked. Snout about as long as eye. Mouth a little oblique, lower jaw a little prominent. Teeth in several rows. In upper jaw outer row enlarged; in lower jaw outer row enlarged, extending to halfway the jaw, laterally inner row enlarged, sometimes some of these teeth are caniniform. Tongue bilobate. A mucous canal from snout to angle of mouth, where it is divided into two canals running longitudinally on cheek. Gill-openings not very wide, isthmus broad. Inner edge of shoulder-girdle without fleshy flaps. First dorsal fin with 6 rays. D. 2 I. 8-11; A. I. 7-9. Pectoral fin with some free silklike rays at the upper margin. Ventral fins united, oblong. Caudal fin obtuse.

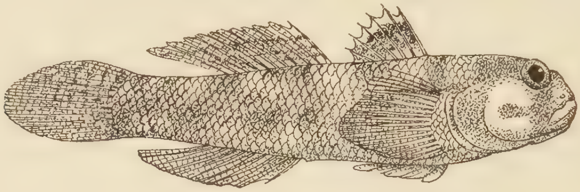

Fig. 45. *Bathygobius fuscus* (Rüpp.). n.s.

Distribution: All tropical seas and estuaries.

Key to the Indo-Australian species of Bathygobius

1. Head scaled above behind eye and between the eyes, on cheek and opercle. About 30 predorsal scales . . . . 1. *B. petrophilus* p. 184.
2. Head scaled above from behind the eye. Cheek and opercle naked. Less than 30 predorsal scales.
   A. About 30 scales in L.l.; 8-9 in L.tr. 2. *B. scapulopunctatus* p. 186.
   B. About 38-40 scales in L.l.; 11-13 in L.tr. . . . . 3. *B. fuscus* p. 187.

1. **Bathygobius petrophilus** (Blkr.)

Gobius petrophilus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 476.
Gobius petrophilus Günther, Cat. Fishes 3, 1861, p. 75.
Gobius petrophilus var. *ocellata* Kner, Sitz. ber. Ak. Wiss. Wien 58, 1868, p. 326.

Gobius cotticeps Steindachner, o.c. 80, 1880, p. 137, pl. 1 figs. 2, 2a.
?*Chlamydes laticeps* Jenkins, Bull. U.S. Fish Comm. 22, (1902) 1904, p. 503, fig. 43.
Chlamydes leytensis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 118, pl. 8 fig. 3.
Gobius petrophilus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 404.
Chlamydes cotticeps Fowler, o.c. p. 406.
Gobius cotticeps Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 62, fig. 15.
Chlamydes laticeps Koumans, Zool. Meded. Leiden 22, 1940, p. 131 (as probable synonym).
Chlamydes leytensis Koumans, o.c. p. 183 (as synonym).

D. 1 VI; D. 2 I. 8-10; A. I. 7-8; P. 20-22; L.l. 38; L.tr. 11-12; Predorsal scales 30.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5 in length, 6-6$^1/_3$ in total length. Head depressed, 3-3$^1/_2$ in length, 3$^3/_4$-4$^1/_3$ in total length. Profile convex. Eye 3$^1/_2$-4 in head, interorbital $^1/_3$-$^1/_2$ eyediameter. Snout obtuse, shorter than eye, tip before lower part of eye. Anterior nostril in a short tube. Lips thick. Jaws equal. Maxillary extends to below middle of eye. Teeth in several rows; in upper jaw outer row enlarged; in lower jaw outer row extends to halfway the jaw. Tongue emarginate. Longitudinal mucous canals on cheek. No pore in interorbital. No pore behind eye. Head scaled above between and behind the eyes and on cheek and opercle with cycloid scales. Scales of breast and belly cycloid, other scales ctenoid. First dorsal fin lower than body, second, third and fourth rays are the longest. Second dorsal fin a little higher than first dorsal fin, but lower than body. Anal fin similar to second dorsal fin. Pectoral fin obtusely rounded, a little shorter than head, upper rays free, silklike. Ventral fin rounded, shorter than head without snout. Caudal fin obtuse, shorter than head. Colour dark red with dark markings above. Fins dark. First dorsal fin with 3-4 dark longitudinal bands. Second dorsal, pectoral and caudal fin with spotted rays. Length 96 mm.

Habitat: Sumatra (Padang); Java (Djakarta, Karangbollong); Bali (northcoast); Timor (Kupang, Atapupu); Buru (Kajeli); Ceram; Ambon; Goram; New Guinea (Doreh). — Japan, Philippines (Leyte!), Society Islands, Hawaiian Islands, Fiji (var. *ocellata* at Viti Levu). — In sea.

Specimens of Bleeker's collection seen in the Leiden Museum, type of *Chlamydes laticeps* seen in U.S. Nat. Museum, type and cotypes of *Chlamydes leytensis* seen in Bureau of Science, Manila.

2. **Bathygobius scapulopunctatus** (Bfrt.) (Fig. 46, p. 186)

Gobius (Rhinogobius) scapulopunctatus De Beaufort, Zool. Anz. 39, 1912, p. 137. — Bijdragen Dierkunde 1913, p. 140, fig. 5.

Rhinogobius scapulopunctatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 411.

Gobius (*Rhinogobius*) *scapulopunctatus* Koumans, Zool. Meded. Leiden 13, 1930, p. 5.

?*Ctenogobius scapulopunctatus* Herre, Checklist from Dumaguete, Journ. Pan Pac. Res. Inst. 8 no. 4, 1933, p. 10. — Notes on Fishes of Stanford Univ. 1, 1934, p. 86. — Field Mus. Nat. Hist. Zool. 21, 1936, p. 369

D. 1 VI; D. 2 I. 7-8; A. I. 7; L.l. ± 30; L.tr. 8-9; Predorsal scales ± 10 .

Body elongate, compressed, height 4-5 in length, 5-6 in total length. Head depressed, $3^1/_3$ in length, 4 in total length. Profile convex. Eye $2^1/_2$-$3^1/_2$ in head, interorbital narrow. Snout rather obtuse, shorter than eye, tip before inferior margin of eye. Anterior nostril tubular. Mouth a little oblique, jaws subequal. Lips thick. Maxillary extends to beyond middle of eye or not so far. Tongue scarcely bilobate. Teeth in several rows; outer row enlarged in upper jaw; in lower jaw outer row a little enlarged. No canines. Open pores round the eye, in supraopercular groove and along hinder margin of preopercle. Two longitudinal rows of mucous canals on cheek. Head scaled above behind eye, rest naked. Scales of body ctenoid, becoming cycloid anteriorly. First dorsal fin lower than body in female, in male middle rays prolonged. Second dorsal and anal fin lower than body, hindermost rays are the longest. Pectoral fin as long as head, silklike rays scarcely developed. Ventral fin short, rays prolonged beyond the membrane. Caudal fin rounded, shorter than head. Colour in spirits greyish with 5 saddlelike transverse bands on back, the first on neck, the second below first dorsal fin, third and fourth below second dorsal fin, fifth on tail. They reach to middle of body, where they are confluent with a longitudinal row of brown blotches. Scales often with dark

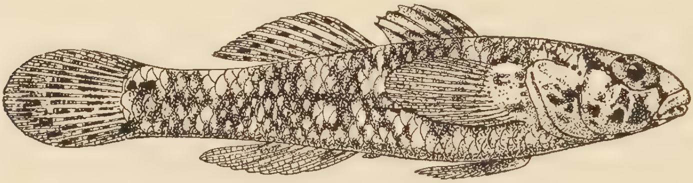

Fig. 46. *Bathygobius scapulopunctatus* (Bfrt.) × 1½.

margin. Dark brown elongated patch under eye, indistinct stripe from eye to maxillary. Brown patch on side and below head. Three to four black spots above origin of pectoral fin, upper part of the fin often with dark transverse stripe. Black spot on dorsal side and in middle of base of caudal fin. Male with some black spots along the side of body. Fins light red to white. First dorsal fin with 2 indistinct black bands. Rays of second dorsal, anal and caudal fin spotted. Pectoral, ventral and anal fin dusky, darker in made. Length 63 mm.

Habitat: Sumba (Mas Marru a branch of Kali Rendah!); Buru (Wae Katin!, Mnges Waen!, Rana lake!); Waigeu (reef of Saonek!). — ?Philippines (Dumaguete), ?Fiji Islands. — In sea and rivers.

Types seen in the Amsterdam Museum.

3. **Bathygobius fuscus** (Rüpp.) (Fig. 45, p. 184)

Gobius fuscus Rüppell, Atl. Reise N. Afr. Fische 1828, p. 137.
Gobius punctillatus Rüppell, o.c. p. 138.
Gobius soporator Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 56.
Gobius nebulopunctatus Cuvier & Valenciennes, o.c. p. 58.
Gobius cyclopterus Cuvier & Valenciennes, o.c. p. 59.
Gobius albopunctatus Rüppell, Neue Wirbelthiere Fische 1838, p. 138.
Gobius nebulopunctatus Rüppell, o.c. p. 139.
Gobius lineatus Jenyns, Zool. Voy. Beagle 1842, p. 95, pl. 19 fig. 2.
Gobius elegans var. Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1161 (not of C.V.).
Gobius nox Bleeker, Nat. Tijdsch. Ned. Indië 1, 1851, p. 248.
Gobius padangensis Bleeker, o.c. p. 249.
Gobius tjilankahanensis Bleeker, o.c. p. 251.
Gobius cocosensis Bleeker, o.c. 7, 1854, p. 47.
Gobius breviceps Blyth, Journ. Asiat. Soc. Bengal 27, 1858, p. 271.
Gobius catulus Girard, Proc. Ac. Nat. Sci. Philadelphia 1858, p. 169.
Gobius mapo Poey, Memorias 2, 1861, p. 277.
Gobius lacertus Poey, o.c. p. 278.
Gobius elegans Günther, Cat. Fishes 3, 1861, p. 18 (not of C.V.).
Gobius albopunctatus Günther, o.c. p. 25.
Gobius nox Günther, o.c. p. 28.
Gobius cocosensis Günther, o.c. p. 30.
Gobius carolinensis Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 268.
Gobius krefftii Steindachner, Sitz. ber. Ak. Wiss. Wien 53 no. 1, 1866, p. 451.
Gobius criniger Steindachner, o.c. 56 no. 1, 1867, p. 326 (not of C.V.).
Gobius brunneus Poey, Synopsis 1868, p. 393 (not of Temm. & Schl.).
Gobius homocyanus Vaillant & Sauvage, Rev. Mag. Zool. 3, 3, 1875, p. 280.
Glossogobius giuris Streets, Bull. U.S. Nat. Mus. 7, 1877, p. 60 (not of H.B.).

Gobius darnleyensis Alleyne & Macleay, Proc. Linn. Soc. N.S. Wales 1, 1877, p. 331, pl. 12 fig. 1.

Gobius nigripinnis Alleyne & Macleay, o.c. p. 332, pl. 12 fig. 2.

Gobius albopunctatus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 172, pl. 110 fig. A.

Gobius graeffii Günther, o.c. p. 179.

Gobius elegans Day, Fishes India 1878, p. 293 (not of C.V.).

Gobius albopunctatus Day, o.c. p. 294, pl. 63 fig. 7.

Gobius sandvicensis Günther, Challenger 6, Shore Fishes 1880, p. 60.

Gobius andrei Sauvage, Bull. Soc. Philom Paris (7) 4, 1880, p. 44.

Gobius caledonicus Sauvage, o.c. p. 46.

Gobius buccatus Macleay, Proc. Linn. Soc. N.S. Wales 5, 1881, p. 601 (not of C.V.).

Gobius flavidus Macleay, o.c. p. 602 (not of C.V.).

Gobius filamentosus Sauvage, Bull. Soc. Philom. Paris (7) 12, 1883, p. 157.

Evorthodus catulus Jornan & Gilbert, Synopsis Fishes N. Am. 1883, p. 632.

Gobius Watkinsoni De Vis, Proc. Linn. Soc. N.S. Wales 9, 1884, p. 685.

Gobius marginalis De Vis, o.c. p. 686.

Gobius aeolosoma Ogilby, Mem. Austral. Mus. 2, 1889, p. 161.

Gobius elegans Day, Fauna Brit. India Fishes 2, 1889, p. 264 (not of C.V.).

Gobius albopunctatus Day, o.c. p. 265.

Gobius albopunctatus Sauvage, Poissons de Madagascar 1891, p. 361, pl. 38 fig. 3.

Gobius variabilis Steindachner, Abh. Senck. Naturf. Ges. 25, 1901, p. 430, pl. 18 figs. 4-4b.

Gobius poecilichthys Jordan & Snyder, Proc. U.S. Nat. Mus. 24, 1901, p. 52. fig. 4.

Mapo fuscus Jordan & Evermann, Bull. U.S. Fish Comm. 23, (1903) 1905, p. 483, fig. 212.

Aboma graeffei Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 396.

Rhinogobius corallinus Jordan & Seale, o.c. p. 400, fig. 89.

Mapo crassiceps Jordan & Seale, o.c. p. 403, fig. 92.

Gobius panayensis Jordan & Seale, o.c. 26 (1906) 1907, p. 42, fig. 15.

Mapo mearnsi Evermann & Seale, Proc. U.S. Nat. Mus. 31, 1907, p. 510, fig. 2.

Gobius ophthalmicus M. Weber, Notes Leyden Mus. 31, 1909, p. 150. — Siboga Exp. Fische 1913, p. 463, fig. 90.

Gobius villosus M. Weber, Notes Leyden Mus. 31, 1909, p. 151. — Siboga Exp. Fische 1913, p. 466, fig. 92.

Gobius variabilis M. Weber, Siboga Exp. Fische 1913, p. 458.

Gobius fuscus M. Weber, o.c. p. 466 1).

Gobius variabilis De Beaufort, Bijdragen Dierkunde 1913, p. 137.

Gobius ophthalmicus De Beaufort, o.c. p. 139.

Mapo poecilichthys Jordan, Tanaka & Snyder, Journ. Coll. Sci. Univ. Tokyo 33 art. 1, 1913, p. 346, fig. 297.

Mapo fuscus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 231, pl. 33 fig. 3.

---

1) *Gobius* spec. mentioned by M. Weber, o.c. p. 491 from Stat. 33. Pidjot Bay, Lombok, belongs to *B. fuscus*.

Mapo krefftii McCulloch & Ogilby, o.c. p. 234, pl. 33 fig. 4.
Gobius panayensis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 106.
Bathygobius bravoi Herre, o.c. p. 112, pl. 8 fig. 1.
Bathygobius fuscus Herre, o.c. p. 113, pl. 8 fig. 2.
Bathygobius nox Herre, o.c. p. 116.
Gobius (Mapo) fuscus Barnard, Ann. South. African Mus. 21, 1927, p. 821.
Gobius variabilis Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 404.
Gobius ophthalmicus Fowler, o.c. p. 404.
Gobius cyclopterus Fowler, o.c. p. 405.
Bathygobius fuscus Fowler, o.c. p. 405.
Drombus whitleyi Fowler, o.c. 11, 1931, p. 362.
Gobius atripinnis Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 81, figs. 21, 22.
Bathygobius fuscus Koumans, Zool. Meded. Leiden 18, 1935, p. 121.
Ctenogobius meggitti Hora & Muckerji, Rec. Indian Mus. 38 pt. 1, 1936, p. 30, fig. 6, pl. 1 figs. 3, 4.
Bathygobius fuscus Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 354.
Gobius villosus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 63, fig. 16.
Gobius fuscus Tomiyama, o.c. p. 63, fig. 17.
Bathygobius fuscus Koumans, Zool. Meded. Leiden 19, 1937, p. 177. — Mem. Indian Mus. 13, 1941, p. 267.
Bathygobius fuscus Fowler, Proc. Ac. Nat. Sci. Philadelphia 89, 1937, p. 250, fig. 260.
Bathygobius fuscus Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 140, fig. 9.
Bathygobius laoe, Roxas & Ablan, Philipp. Journ. Sci. 73, 1940, p. 306, pl. 4.
Bathygobius blancoi Roxas & Ablan, o.c. p. 306, pl. 5.
Rhinogobius corallinus Koumans, Zool. Meded. Leiden 22, 1940, p. 125 (as synonym).
Mapo crassiceps Koumans, o.c. p. 125 (as synonym).
Mapo mearnsi Koumans, o.c. p. 128 (as synonym).
Gobius atripinnis Koumans, o.c. p. 134 (as synonym).
Gobius panayensis Koumans, o.c. p. 145 (as synonym).
Gobius darnleyensis Koumans, o.c. p. 157 (as synonym).
Gobius nigripinnis Koumans, o.c. p. 157 (as synonym).
Mapo fuscus, cotypes of *Mapo marginalis* Koumans, o.c. p. 163 (as synonym).
Mapo aeolosoma Koumans, o.c. p. 163 (as synonym).
Gobius watkinsoni Koumans, o.c. p. 174 (as synonym).
Gobius marginalis Koumans, o.c. p. 175 (as synonym).
Bathygobius bravoi Koumans, o.c. p. 183 (as synonym).
Bathygobius fuscus Koumans in Blegvad & Løppenthin, Danish Sci. inv. Iran, prt 3, 1944, p. 162, fig. 93.

D 1 VI; D. 2 I. 9-10; A. I. 8-9; P. 19-20; L.l. 38-40; L.tr. 11-13; Predorsal scales 24 or less.

Body elongate, anteriorly cylindrical, posteriorly compressed; height $4^3/_4$-5 in length, 6-$6^1/_2$ in total length. Head depressed, $3^1/_4$-$3^3/_5$ in length, $4^1/_5$-$4^2/_3$ in total length. Profile convex.

Eye $3-4^1/_2$ in head, interorbital $^2/_5-^2/_3$ eyediameter. Snout obtuse, as long as, or shorter than eye, tip before lower margin of eye. Anterior nostril in a short tube. Lips thick. Jaws subequal. Maxillary extends to below posterior part of eye, or not so far. Teeth in several rows; in upper jaw outer row enlarged; in lower jaw outer row enlarged, extending to halfway the jaw, inner row laterally enlarged. Tongue more or less bilobate. Longitudinal rows of mucous canals on cheek. An open pore anteriorly medially in interorbital, another on each side behind eye at the beginning of the supraopercular groove. Head scaled above behind the eyes with rudimentary scales; sometimes upper parts of opercle scaled. Scales of head, nape, breast and belly cycloid, on rest of body ctenoid. First dorsal fin lower than body, the middle rays are the longest. Second dorsal fin a little lower than body, pointed posteriorly. Anal fin shorter than second dorsal fin. Pectoral fin rounded, a little shorter than head, upper rays free, silklike. Ventral fin obtusely rounded, about as long as pectoral fin, basal membrane with a lobe on each side. Caudal fin obtuse, about as long as head. Colour in spirits very variable, olivous above, lighter below. Head and body with irregular spots, on body often placed in two alternating longitudinal rows. Head sometimes with shiny spots, body sometimes with a shiny spot laterally on each scale. Fins dark to light, with or without dark markings. Rays of dorsal fins, pectoral and caudal fin spotted. Length 120 mm.

Habitat: Abundant in the whole archipelago. — From east coast of Africa and Red Sea to Japan, Philippines, Australia and islands in the Pacific to America.

Types of *Gobius nox, G. cocosensis* seen in the Leiden Museum, types of *G. ophthalmicus, G. villosus* seen in the Amsterdam Museum, types of *G. soporator, G. albopunctatus, G. cyclopterus, G. caledonicus, G. filamentosus, G. homocyanus* seen in Paris Museum, type of *G. graeffii* and type of *G. elegans* var. Cantor seen in British Museum (N.H.), type of *Rhinogobius corallinus,* type of *Mapo crassiceps,* and type of *Mapo mearnsi* seen in U.S. Nat. Museum, type and paratype of *Gobius atripinnis* seen in Academy of Nat. Sciences, Philadelphia, type of *Gobius panayensis* seen in Stanford University, type of *Gobius nigripinnis* and *G. darnleyensis* seen in Macleay Museum, Sydney, type of *G. aeolosoma* and cotypes of *G. marginalis* seen in Australian Museum, Sydney, type of *Gobius marginalis* and type of *G. watkinsoni* seen in Queensland Museum, Brisbane, type and cotype of *Bathygobius bravoi* seen in Bureau of Science, Manila.

35. **Hemigobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 319)

Body elongate, covered with about 20 ctenoid scales. Head subcylindrical, pointed, scaled above behind the eye and on opercle and preopercle; an unpaired foremost scale behind the eye in median line. Bony interorbital and snout about as long as diameter of eye. Mouth very oblique, upper jaw with a curve, receiving the tip of lower jaw. Teeth in both jaws in several rows, the middle is enlarged, in upper jaw a little truncate, in lower jaw subhorizontal, other rows small, no canines. Tongue bilobate. Mucous canals and pores indistinct. Gillopenings continued a little forward below, isthmus moderate. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 and A. I. 7; Ventral fins united. Pectoral fin without free silklike rays, base scaled. Caudal fin obtuse.

Distribution: Indo-Australian Archipelago.

1. **Hemigobius bleekeri** nom. nov. (Fig. 47, p. 191)

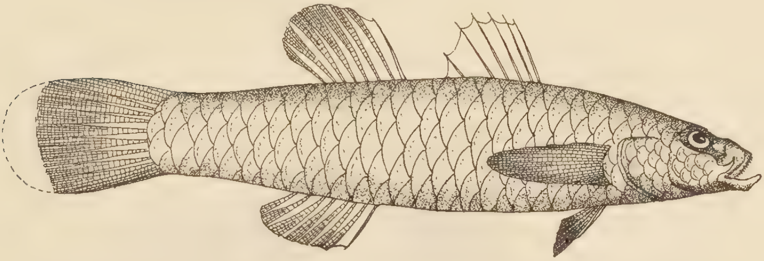

Fig. 47. *Hemigobius bleekeri* nom. nov. × 1½.

Gobius melanurus Bleeker, Verh. Bat. Gen. 22, 1849 p. 31 (not *Gobius melanurus* Broussonet, Ichthyologia 1782, nom. nud., not *Gobius melanuros* Gmelin in Linnaeus, Syst. Nat. ed. 13, 1789, p. 1201, not *Gobius melanurus* Bl. Schn., Syst. Ichth. 1801, p. 74).

Gobius melanurus Günther, Cat. Fishes 3, 1861, p. 33 (not of Brouss., Gmel. or Bl. Schn.).

D. 1 VI; 2 I. 7; A. I. 7; P. 13-16; L.l. 22; L.tr. 7; Predorsal scales 7-8.

Body elongate, anteriorly subcylindrical, height 5 in total length. Head acute, 5-$5^{1}/_{2}$ in total length. Dorsal profile convex. Eye 3-4 in head, interorbital about 1 eyediameter. Snout a little shorter than eye, tip before lower margin of eye. Mouth oblique. Upper jaw protractile, prominent. Maxillary extends to before eye. Teeth in upper jaw with the tip truncate, compressed? In lower jaw teeth not compressed, outer row enlarged. Head scaled on front, nape preopercle and opercle with ctenoid scales, 6-7 longitudinal rows on preopercle, 3-4 on opercle. Scales of body ctenoid. Dorsal fins distant. First dorsal fin pointed, half as high as body, middle rays are the longest. Second dorsal fin higher than the first, pointed posteriorly. Pectoral fin without free rays, obtusely rounded. Ventral fin pointed, a little longer than head. Anal fin similar to second dorsal fin. Caudal fin obtusely rounded, a little longer than head. Colour blackish. Caudal fin with 3 yellowish transversal stripes. First dorsal fin black, other fins with blackish spots. Length 69 mm.

Habitat: Biliton (Tjirutjup); Java (Surabaja?); Sunda Archipelago!. — In rivers and estuaries.

Types seen in the Leiden Museum.

36. **Brachygobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 315)

Hypogymnogobius Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 318.
Thaigobiella H. M. Smith, Proc. U.S. Nat. 79, 1931, art. 7, p. 35.

Body elongate, subcylindrical anteriorly, compressed posteriorly, covered with 25-50 ctenoid scales. Head depressed. Head and nape scaled with very thin cycloid scales in the median part; these scales fall out readily. Opercle scaled with large ctenoid scales. Neck with a median longitudinal groove. Bony interorbital and snout

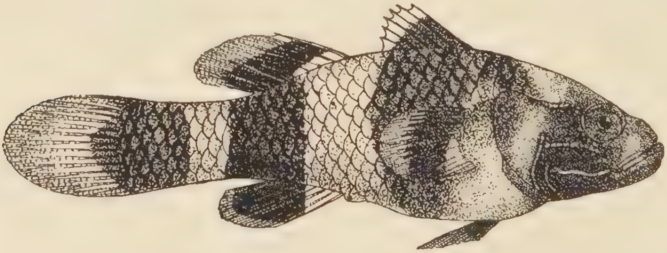

Fig. 48. *Brachygobius nunus* (H.B.) × 2½.

about 1 eyediameter. Mouth oblique, lower jaw a little prominent. Teeth in both jaws in several rows, the outer one a little enlarged, no canines. Tongue truncate. Some curved longitudinal mucous canals under eye, some on opercle and one along mandible to posterior margin of preopercle. Gillopenings not continued forward below, isthmus broad. No fleshy flaps on inner edge of shouldergirdle. Dorsal fins widely separated. First dorsal fin with 6 rays. D. 2 and A. I. 7-10. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin rounded.

Distribution: India, Malay States, Siam, Indo-Australian Archipelago.

Key to the Indo-Australian species of Brachygobius

1. About 50 scales in L.l. Second dorsal and anal fin I. 8-9. . . . . 1. *B. xanthozona* p. 193.
2. 25-27 scales in L.l. Second dorsal and anal fin I. 7. 2. *B. nunus* p. 194.
3. 22-26 scales in L.l. Second dorsal and anal fin I. 6. 3. *B. aggregatus* p. 196.

1. **Brachygobius xanthozona** (Blkr.)

Gobius xanthozona Bleeker, Verh. Bat. Gen. 22, 1849, p. 34.
Gobius xanthozona Günther, Cat. Fishes 3, 1861, p. 66.
Hypogymnogobius xanthozona Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 319.

D. 1 VI; D. 2 I. 8-9; A. I. 8-9; P. 19; L.l. ± 50; L.tr. 15-16.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^{1}/_{3}$-$4^{2}/_{3}$ in total length. Head depressed, $3^{3}/_{4}$-4 in total length. Dorsal profile straight to a little convex above eye. Eye 5 in head, interorbital $1^{1}/_{2}$-2 eyediameters. Snout depressed, not longer than eye, tip before middle of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below eye. Teeth in many rows, pointed, small. Outer row in upper jaw enlarged, distant, conical. Head naked above behind eye, only opercle and subopercle scaled with ctenoid scales, on opercle 7 rows. Scales of body ctenoid, larger on posterior part of body. Body before and below first dorsal fin naked. Dorsal fins distant. First dorsal fin half as high as body, third and fourth rays are the longest. Second dorsal and anal fin a little higher than first dorsal fin, obtuse. Pectoral, ventral and caudal fin shorter than head without snout.

Pectoral and caudal fin obtusely rounded. Ventral fin pointed. Colour yellow with 4 black transverse bands, about as broad as the interspaces. The first through eye and preopercle, second from first dorsal fin to ventral fin, third from second dorsal fin to anal fin, fourth on posterior part of caudal peduncle and on base of caudal fin. Dorsal fins and anal fin black, oher fins yellow. Pectoral and ventral fin with black bases. Length 44 mm.

Nom. indig.: Puntang (Jav.).

Habitat: Sumatra (Palembang); Borneo (Sinkawang, Pontianak!); Java (Djakarta!, Surabaja!). — In rivers and estuaries.

Types seen in the Leiden Museum.

2. **Brachygobius nunus** (H. B.) (Fig. 48, p. 192)

Gobius nunus Hamilton Buchanan, Gangetic Fishes 1822, pp. 54, 366.
Gobius Doriae Günther, Ann. Mag. Nat. Hist. (4) 1, 1868, p. 265, pl. 12 fig. A.
Gobius nunus Day, Fishes India 1878, p. 297. — Fauna Brit. India Fishes 2, 1889, p. 269.
Gobius alcockii Annandale, Journ. Asiat. Soc. Bengal (N.S.) 2, 1906, p. 201, fig.
Ctenogobius alcocki Hora, Mem. Indian Mus. 5, 1923, p. 744.
Gobius Doriae Vinciguerra, Ann. Mus. Civ. Genova 50 (Ser. 3 no. 10), 1926, p. 539.
Gobius nunus Hora, Mem. Indian Mus. 9, 1929, pl. 14 fig. 5 (M.S. drawing of H.B.).
Thaigobiella sua H. M. Smith, Proc. U.S. Nat. Mus. 79, 1931, art. 7, p. 35, fig. 17.
Ctenogobius nunus Hora, Rec. Indian Mus. 36, 1934, p. 488.
Brachygobius doriae Hardenberg, Treubia 15, 1936, p. 252.
Brachygobius xanthomelas Herre, Bull. Raffles Mus. 13, 1937, p. 43, pl. 4 figs. a, b.
Brachygobius xanthozona Fowler, Proc. Ac. Nat. Sc. Philadelphia 89, 1937, p. 248, figs. 263-278. (not of Blkr.).
Brachygobius xanthomelas Koumans, Zool. Meded. Leiden 22, 1940, p. 153 (as synonym).
Brachygobius nunus Koumans, Mem. Indian Mus. 13, 1941, p. 269.
Brachygobius sua H. M. Smith, Bull. 118 U.S. Nat. Mus., 1945, p. 549.

D. 1 VI; D. 2 I. 7; A. I. 7; P. 14-16; L.l. 25-27; L.tr. 8; (Predorsal scales 10-11).

Body oblong, anteriorly cylindrical, posteriorly compressed, height $3^{3}/_{4}$-4 in total length. Head obtuse, convex, depressed, $3^{1}/_{2}$ in length, $3^{2}/_{3}$-4 in total length. Dorsal profile convex. Eye $3^{1}/_{3}$-4 in head, interorbital 1-2 eyediameters. Snout depressed, convex, shorter than eye, tip before middle of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below anterior part of eye. Teeth in many rows, pointed, outer row in upper jaw enlarged, distant, conical. Laterally on head some longitudinal rows of mucous canals. Head scaled from a little behind the eyes to insertion of first dorsal fin with very thin cycloid scales, which fall out readily, therefore the head behind the eyes is in preserved specimens mostly naked. Opercle and subopercle scaled for the greater part with ctenoid scales, on opercle in 4 rows. Scales of body ctenoid, laterally posteriorly the largest. Body scaled below first dorsal fin. Dorsal fins distant. First dorsal fin half as high as body, third and fourth rays are the longest. Second dorsal and anal fin a little higher than first dorsal fin, obtuse. Pectoral and caudal fin obtusely rounded, shorter than head without snout. Ventral fin obtuse, shorter than pectoral fin. Colour yellow with 4 blackish transverse bands, broader than the interspaces: the first through eye, second from first dorsal fin to ventral fin, third from second dorsal to anal fin, fourth on base of caudal fin. Head greyish. Dorsal fins and anal fin black with yellow margin, or totally yellow. Other fins yellow. Pectoral and ventral fin with blackish base.

In a variety there may be, besides the 4 transverse bands, 1-3 narrow bands on dorsal part of body, one between first and second band, another between second and third, another between third and fourth band. Length 42 mm.

Nom. indig.: Kakatjangan, Bogo tjina (Sund.), Kondang Kendas, Katjang Katjang, Gobo (Mal, Djakarta).

Habitat: Singapore!; Sumatra (Palembang!, Medan); Borneo (Pontianak!, Sinkawang, Sarawak!); Java Sea!; Java (Bay of Djakarta!, Djakarta!, Bogor!, Tjampea near Bogor!). — India!, Straits Settlements!, Johore!, Siam!. — In sea and fresh water.

Types of *Gobius doriae* seen in British Museum (N.H.), type and paratypes of *Brachygobius xanthomelas* seen in Stanford University, types of *Gobius alcocki* seen in Indian Museum, Calcutta.

Note: In several specimens of *Gobius alcocki* from Chilka lake, British India, I found the head scaled from a little behind the eyes with thin cycloid scales. These scales fall out readily, leaving no visible pouches. One type specimen of *Gobius doriae* in the British Museum (N.H.) shows about 9 predorsal scales. The specimens of Bleeker's collection of *Brachygobius doriae* are all naked in the median part before first dorsal fin. Some specimens from Tjampea near Bogor (Java), however, show some cycloid scales on the nape. As the foremost scale behind eye is unpaired and a little larger than the following ones, *Brachygobius* is closely allied to *Stigmatogobius*. It differs, however, in having ctenoid scales on the opercle, these scales are cycloid in *Stigmatogobius*.

It seems that the specimens from the Indian and Malayian region remain smaller in size than those of the Indo-Australian Archipelago.

3. **Brachygobius aggregatus** Herre

Brachygobius aggregatus Herre, Philipp. Journ. Sci. 72 no. 4, 1940, p. 361, pl. 4.

D. 1 VI; D. 2 I. 6; A. I. 6; L.l. 22-26; L.tr. 7-8.

Body robust, height 3-3$^1/_3$ in length. Head depressed, 2.7-3 in length. Dorsal profile slightly convex. Eye 3.25-3.7 in head, interorbital one eyediameter. Snout shorter than eye, 4.5-4.8 in head, tip before lower margin of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below front margin of eye. Teeth as stated for the genus. Head described by Herre to be naked above behind the eyes. Opercle with one or two scales near the upper margin. Dorsal fins separate. First dorsal fin low, about $^1/_3$ of height of body, middle rays are the longest. Second dorsal fin and anal fin a little higher than first dorsal fin, obtuse. Pectoral fin and ventral fins 1.5-1.8 in head. Caudal fin obtusely rounded, about as long as head. Colour according to Herre: "in life butter-yellow, with 4 broad black bands over back; first band extending from nape to anterior part of first dorsal, anterior portion extending down upon opercle, rear portion running down beneath pectoral to meet its fellow on abdomen; in young specimens there are two bands which unite to form the wide band just described; second band extending from insertion of first dorsal to middle of second dorsal base, with a belt extending below second dorsal to middle of anal base; third band behind vertical fins, fourth on caudal base, third and fourth on under side of caudal peduncle; snout and interorbital dusky, sides and under part of head sprinkled with black dots; pectoral with a black spot on base; other fins all clear, except where crossbands touch dorsals. In alcohol the yellow fades to whitish, markings unchanged." Length 44 mm (standard length).

Habitat: British North Borneo (Kabili river). — Philippines (Dumaguete). — In brackish and fresh water.

Note: This species is closely allied to *B. nunus* (H.B.), but probably distinct. Not seen by us.

37. **Cryptocentroides** Popta

(Popta, Zool. Meded. Leiden 7, 1922, p. 32)

Body elongate, compressed, covered with less than 85 scales, ctenoid, or ctenoid on the posterior part of the body, cycloid on the anterior part, or totally cycloid. Head a little compressed, naked. Bony interorbital narrow. Mouth oblique. Teeth in both jaws in several rows, the outer enlarged. Outer row of lower jaw extending to halfway the jaw, last teeth are recurved canines. Some open pores and longitudinal mucous canals on head. Gillopenings wide, isthmus narrow. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 11-13; A. I. 12-13. Ventral fins united. Pectoral fin without free silklike rays. Caudal fin rounded, shorter than head, or as long as head.

Distribution: Indo-Australian Archipelago, Philippines, Solomon Islands.

1. **Cryptocentroides insignis** (Seale) (Fig. 49, p. 198)

Amblygobius insignis Seale, Philipp. Journ. Sci. D 5, 1910, p. 116, pl. 2 fig. 1.
Gobius (Cryptocentrus) stigmatophorus De Beaufort, Zool. Anz. 39, 1912, p. 136. — Bijdragen Dierkunde 1913, p. 141.
Cryptocentroides dentatus Popta, Zool. Meded. Leiden 7, 1922, p. 33.
Amblygobius insignis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 234, pl. 18 fig. 3.
Cryptocentrus stigmatophorus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 414.
Cryptocentroides insignis Koumans, Zool. Meded. Leiden 18, 1935, p. 144.
Amblygobius insignis Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 376, fig. 28.
Cryptocentroides insignis Koumans, Zool. Meded. Leiden 22, 1940, pp. 180, 181.
Amblygobius insignis Koumans, o.c. p. 189 (as synonym).

D. 1 VI; D. 2 I. 11-13; A. I. 12-13; P. 16-17; L.l. 70-75; L.tr. 25-30.

Body elongate, compressed, height 5-5$^2/_5$ in length, 6-6$^3/_5$ in total length. Head a little compressed, more than 3 to 3$^3/_4$ in length,

$4^1/_2$ in total length. Eye $3^2/_3$-$4^5/_6$ in head, interorbital narrow. Snout obtuse, shorter than eye. Mouth oblique. Maxillary extends to below anterior half of eye. Teeth in several rows, outer row enlarged, caninoid. Eight teeth on each side in upper jaw, 5-6 on each side in lower jaw. Outer row of teeth in lower jaw extends to halfway the jaw, the last teeth are curved canines. Tongue rounded. Two longitudinal mucous canals on cheek, one round the lower part of eye. An open pore in median line anteriorly in interorbital, one in median line posteriorly, some in supraoperculer groove. A low dermal crest in median line before first dorsal fin. Head naked, nape naked. Scales of body ctenoid, beginning from a line from the insertion of first dorsal fin to the upper end of the gillopenings, only the foremost rows are more or less cycloid. Second or third ray of first dorsal fin is the longest. First dorsal fin lower than body. Second dorsal fin lower than the first. Caudal fin oblong, shorter than head. Colour greyish brown with about 14 narrow light yellowish green bands on body, running from back obliquely downward and backward. Most of the scales of the body have a blue vertical stripe. Cheek and opercle spotted with light blue ocelli, surrounded by deeper blue, or some oblique bands on head. Black spots on sides of head and body, behind pectoral fin red spots. Some larger spots behind eye and above the hinder margin of opercle, forming a conspicuous dark patch. A dark brown band across base of first dorsal fin; three rows of black spots on second dorsal fin. Margin of anal fin black, with red submarginal band and red spot at the base between each ray. Caudal fin crossed by about 5 dark bands, formed by spots between the rays. Pectoral

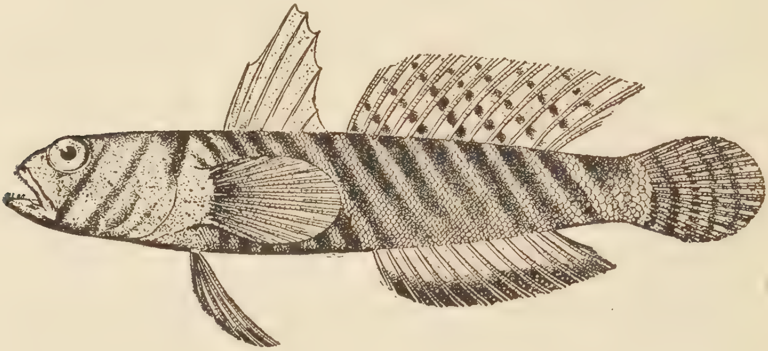

Fig. 49. *Cryptocentroides insignis* (Seale). After Herre.

fin dusky at the base. Ventral fin pigmented with dusky spots. Length 86 mm.

Habitat: Java (Bay of Djakarta!); Sulu Islands (Sitankai!, Jolo!); Muna (Raha); Aru Islands (Wolil!); Waigeu (reef of Saonek!). — Philippines (Bantayan Islands!), Solomon Islands.

Type of *Gobius* (*Cryptocentrus*) *stigmatophorus* seen in the Amsterdam Museum, type of *Amblygobius insignis* seen in Bureau of Science, Manila.

3. Subfamily PERIOPHTHALMINAE

Body very elongate. Head truncate, scaled above, on cheek and opercle. Eye prominent above the dorsal profile, lower eyelid well developed. Teeth in upper jaw in 1-2 rows, in lower jaw in 1 row. Scales cycloid to weakly ctenoid. Second dorsal fin not much longer than the first one. Pectoral fin with a muscular base, this fin can be bent on the place of insertion of the rays, and used as a locomotion organ on dry land. Ventral fins from totally united, infundibuliform, to only united with their bases, or the fins are totally separated and the basal membrane wanting. Gillopenings not very wide.

Distribution: West coast of Africa to the Pacific.

Note: In treating the group of Periophthalminae I followed for the greater part B. Eggert, Zool. Jahrbücher Abt. Systematik 67 Heft $^1/_2$, 1935, p. 29-116, pl. 1-9. In this paper Eggert states several new species and subspecies. I have not seen specimens of a number of them, so in that case, I made the description after Eggert. For the greater part I agree with the paper by Eggert, in a few cases he made errors, which are described at the concerning species. The division into subspecies is only possible when there are freshly caught or very well preserved specimens at hand, as the colours fade soon in spirits.

As there is much confusion about the identification of the different species, only the localities are listed from which I have seen specimens, or which are stated by Eggert.

Key to the Indo-Australian genera of Periophthalminae

1. Teeth in upper jaw in a single row. . . . 1. *Periophthalmus* p. 200.
2. Teeth in upper jaw in two rows . . . . 2. *Periophthalmodon* p. 215.

1. **Periophthalmus** Bloch ed. Schneider

(Bloch ed. Schneider, Syst. Ichth. 1801, p. 63)

Euchoristopus Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 271.

Body elongate, a little compressed, covered with about 60-100 cycloid to very weakly ctenoid scales. Head compressed, scaled above behind the eyes and on cheek and opercle, to totally scaled. Eyes close together and prominent above the dorsal profile, lower eyelid well developed. Snout blunt, about as long as the eye. Anterior nostril in a tube in a triangular lobule above the upper lip. Mouth horizontal, jaws equal. Teeth in both jaws in a single row, uneven, anterior ones more or less caninoid. Tongue rounded, nearly totally adnate to the floor of the mouth. Gillopenings narrow, placed before the lower $^3/_4$ of the pectoral fin, isthmus broad. Dorsal fins close together. First dorsal fin with 8-17 rays. Second dorsal and anal fin I. 10-14. Ventral fins only united with their bases, not infundibuliform, the rays being completely separated, to united to halfway the rays, a low basal membrane being present, to totally united, infundibuliform. Pectoral fin with a muscular base. Caudal fin asymmetrical, the dorsal rays are longer than the ventral ones, oblong.

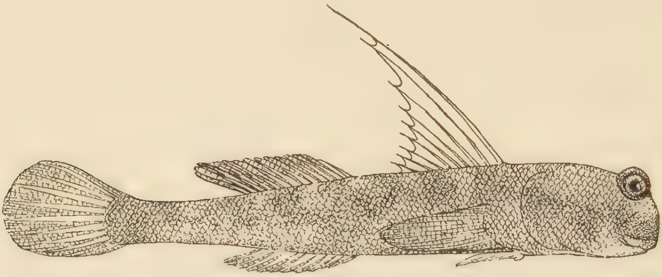

Fig. 50. *Periophthalmus chrysospilos* Blkr. n.s.

Distribution: Tropical seas of both sides of Africa, Red Sea to the Pacific, Australia.

Key to the Indo-Australian species of Periophthalmus

1. D. 1 and D. 2 in male more or less
contiguous, in female D. 1 reduced to

4-6 rays, separated from D. 1. . . . . . 1. *P. weberi* p. 201.

2. D. 1 and D. 2 not contiguous. D. 1 not reduced in females.
  - A. Ventral fins totally united, not emarginate; basal membrane well developed . . . . 2. *P. chrysospilos* p. 202.
  - B. Ventral fins united, totally or about to halfway the fin; basal membrane well developed.
    - *a*. D. 1 VIII-IX; L.l. 80-90 . . . 3. *P. cantonensis novae-guineaensis* p. 203.
    - *b*. D. 1 XI; L.l. 55-60 . . . . . . 4. *P. malaccensis* p. 205.
  - C. The two halfs of ventral fin united by a narrow membrane; basal membrane moderate to weak. L.l. 60-70. 5. *P. variabilis* p. 205.
  - D. Inner rays of ventral fins only united at the base by a membrane, which is deeply emarginate; basal membrane moderate to weak.
    - *a*. D. 1 weakly convex to concave, with the front and back margins nearly parallel. L.l. 80-90 . . . . 6. *P. harmsi* p. 207.
    - *b*. D. 1 convex, back margin not parallel to front margin. L.l. 70-80. 7. *P. koelreuteri* p. 207.
  - E. The two halfs of ventral fin are separated, a very narrow membrane is mostly present; basal membrane very weak to absent.
    - *a*. D. 1 low, convex, IX-XII, with a dark blotch posteriorly. L.l. 70-80. 8. *P. gracilis* p. 210.
    - *b*. D. 1 higher, strongly concave, the foremost rays are the longest, X-XVII. L.l. 70-95 . . . . 9. *P. vulgaris* p. 210.
  - F. The two halfs of ventral fin are separated to the base; basal membrane absent.
    - *a*. D. 1 longer than high, convex, near margin no distinct black band. L.l. 60-70 . . . . 10. *P. dipus* p. 212.
    - *b*. D. 1 fan-like, convex, below the white margin a broad black band, which becomes narrower towards the end of the fin. L.l. 70-90. . . 11. *P. argentilineatus* p. 214.

1. **Periophthalmus weberi** Eggert

Periophthalmus schlosseri M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 602 (pro parte, not of Pall.).

Periophthalmus weberi Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 55, pl. 2 figs. 6, 7.

Male D. XII-XIV, I. 12; A. I. 11; P. 11-13; L.l. 50-55; L.tr. 1 13; L.tr. 2 11; Predorsal scales ± 20-± 25.

Female: D. 1 IV-VI; D. 2 I. 11; A. I. 11; P. 11-13; L.l. 50-55; L.tr. 1 13; L.tr. 2 11; Predorsal scales ± 20-± 25.

Body elongate, height $5^1/_2$ in length, $6^1/_2$-7 in total length. Head $3^3/_4$ in length, $4^1/_2$ in total length. Teeth in one row in upper jaw, anteriorly caninoid. Dorsal fins in male more or less contiguous, first dorsal fin concave, the first ray often is prolonged. In female the dorsal fins are separate, the first one is small. Second dorsal fin a little higher than the first. Basal membrane of ventral fin absent, the fins are only united at the base. Colour gray brown to black brown, ventral part lighter. At the back black stripes or blotches, which may be united as a network. Head with some stripes or blotches, which are mostly not present on the opercle and replaced by black spots. Frontpart of head mostly with pearly stripes or spots. First dorsal fin dark with broad white margin, rest of the fin with longitudinal rows of light round to oval spots. Second dorsal fin of the same colour. Pectoral fin with black transverse stripe on base. Ventral fin light with dark central part. Base of anal fin light, darker towards margin. Rays of caudal fin dark. Length 95 mm.

Habitat: New Guinea (Noord river!, Lorentz river!).

Types seen in the Amsterdam Museum.

2. **Periophthalmus chrysospilos** Blkr. (Fig. 50, p. 200)

Periophthalmus chrysospilos Bleeker, Nat. Tijdschr. Ned. Indië 3, 1853, p. 728.
Periophthalmus chrysospilos Günther, Cat. Fishes 3, 1861, p. 100.
Periophthalmus chrysospilos Eggert, Zeitschr. wiss. Zool. 133, 1928, pp. 398, 400.
?*Periophthalmus chrysospilos* Hardenberg, Treubia 13, 1931, p. 141.
Periophthalmus chrysospilos Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 56, pl. 2 fig. 8, pl. 3 fig. 9.
Periophthalmus chrysospilos Koumans, Mem. Indian Mus. 13, 1941, p. 287.

D. 1 IX-X; D. 2 I. 11-13; A. I. 10-12; P. 14-15; L.l. 70-75; L.tr. 1 17. L.tr. 2 12; Predorsal scales 25.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 6 in length, $7^1/_3$-$7^1/_2$ in total length. Head truncate, a little compressed, $3^3/_4$-4 in length, 4-$4^2/_3$ in total length. Eye $4^1/_3$-5 in head. Teeth on each side in each jaw 15-20, anterior ones a little caninoid. Scales on caudal peduncle not, or a little larger than those of front of body. Dorsal fins separate. First dorsal fin pointed, triangular, two times as high as body. Anterior rays prolonged in male. Second dorsal fin lower than body. Pectoral fin about as long as head, basal half scaled. Basal membrane of ventral fin well developed, fin not emarginate posteriorly, totally united. Anal fin shorter and lower than second dorsal fin. Caudal fin obtuse, obliquely rounded, about as long as head. Colour yellowish green to brownish above, smoky white below. Head and body with orange dots. Base of first dorsal fin bluish green, middle yellowish green. Rays on outer part red, with blackish spots between them. Outer margin from first to third ray white, posteriorly reddish, filament of dorsal rays red. Second dorsal fin yellowish green with dark longitudinal band halfway. Caudal fin bluish green above, brownish below. Anal and ventral fin whitish. Pectoral fin yellowish green with orange dots. Length 120 mm.

Habitat: Singapore; Pulu Ubin!; Pulu Brani; Banka (Karang hadji); Sumatra (Belawan!, Sungi Sikambing near Medan, Betingtjamar, ?Bagan Si Api Api); Sibirut Island; Java (Djakarta!, Tandjong Priok!). — India (Vizagapatam!), Malay Peninsula!.

Type seen in the Leiden Museum.

Note: The specimens from India belong to a variety of *Periophthalmus chrysospilos,* which have the first dorsal fin totally black ,except the first ray and the outer margin of the fin between the first and the fifth ray, behind this, the margin is very narrow. These parts are white, probably red in life.

Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 57, states that this species has in life numerous irregular blue spots. This is certainly an error, as the 188 specimens, which I studied alive in Djakarta, all show orange dots. The prolonged first or first and second rays of dorsal fin in male are red.

3. **Periophthalmus cantonensis novae-guineaensis** Eggert

Periophthalmus koelreuteri M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 262 (pro parte, not of Pall.) — o.c. 9 Zool. 4, 1913, p. 603 (pro parte, not of Pall.).

Periophthalmus cantonensis novae-guineaensis Eggert, Zool. Jahrb. Syst. 67, Heft 1/2, 1935, p. 6, fig. 2, pl. 3 fig. 12.

D. 1 VIII-IX; D. 2 I. 11; A. I. 19; L.l. 80-90; L.tr. 1 20; L.tr. 2 18; Predorsal scales 30.

Body elongate, height $5^1/_2$ in length, $6\text{-}6^1/_2$ in total length. Head 4 in length, 4.8-5 in total length. Teeth in one row in upper jaw, no canines. Dorsal fins separate. First dorsal fin longer than high, a little convex, lower than body. Anal fin a little lower than first dorsal fin. Ventral fins united to halfway the fin, or nearly totally; basal membrane well developed. Colour greyish brown with oblique dark stripes, also present on head and opercle. First dorsal fin with broad light margin, base dark gray. Second dorsal fin with narrow light margin with a brown longitudinal band below it, base white with a row of dark spots. Pectoral and ventral fin dusky, lighter towards margin. Anal fin colourless. Caudal fin light gray with spots in transverse lines. Length 62 mm.

Habitat: New Guinea (Merauke!, Lorentz river!).

Type and cotypes of the subspecies seen in the Amsterdam Museum.

Note: This is a subspecies of *Periophthalmus cantonensis* of which the other subspecies *P. cantonensis cantonensis* (Osbeck) occurs in China, Japan, Korea and Formosa. *P. cantonensis novaeguineaensis* differs from *P. cantonensis cantonensis* in a lower number of rays in first dorsal fin, 8-9 instead of 10-16, and distinct scales on body, while in *P. c. cantonensis* the scales are indistinct, so that the myomeres are visible.

As synonyms of *P. c. cantonensis* are to be named *P. modestus* Cantor, Ann. Mag. Nat. Hist. 9, 1842, p. 484, and *P. modestus* Temminck & Schlegel, Fauna japonica Pisces 1845, p. 147, pl. 76 fig. 2.

The name *Apocryptes cantonensis* does not occur in Osbeck, Reise nach Ostindien und China 1765, p. 171, neither I found the name in the index of this book. Sherborn's Index Animalium does not state the name, so probably the name does not occur in the English translation of Osbeck's book of 1771 too.

Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 188 state *Apocryptes cantonensis* Osbeck as a variety or closely allied to *P. koelreuteri*. So the name becomes *P. cantonensis* (Osbeck) C.V. Linnaeus stated *Apocryptes cantonensis* wrongly as a synonym of *Gobius niger*. Under the last name the species is stated in Osbeck's book of 1765, p. 171.

4. **Periophthalmus malaccensis** Eggert

Periophthalmus malaccensis Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 62, figs. 3-4.

D. 1 XI; D. 2 I. 10; A. I. 9; L.l. 55-60; L.tr. 15-16; Predorsal scales ± 25.

Body elongate, height $5^1/_2$ in length, 7 in total length. Head compressed, $3^3/_4$ in length, $4^1/_2$ in total length. Teeth in one row in upper jaw. In front in upper and lower jaw some canines. First dorsal fin triangular, margin feebly convex, first ray in male prolonged. Anal fin lower than second dorsal fin. Pectoral fin as long as head. Ventral fins united by a narrow membrane to the tip of inner rays, basal membrane well developed. Colour gray with dark irregular transverse stripes, belly lighter. Between eye and first dorsal fin light spots. First dorsal fin dark brown, the foremost two or three rays white. Margin narrow, white, a blackish brown band below it, which becomes narrower at the posterior part of the fin. Between this band and the darkbrown base is a row of small light spots. Base, except on the membrane between the foremost 4-5 rays, with many small, white spots, partly in oblique rows. Second dorsal fin with lightbrown margin, below it a blackish brown band, bordered on both sides by a row of small light spots. Base darkbrown with light spots. Base of pectoral fin silvergray with light spots, fin white with dark rays. Ventral fin white with gray blotch on each half of the fin; upper side of ventral fin dark gray with a broad white margin. Anal fin lightgray to darkgray, margin white. Caudal fin whitish with dark spotted rays and oblique stripes. Length 100 mm.

Habitat: Singapore. — West coast of Malay Peninsula (Kuala Langat!).

5. **Periophthalmus variabilis** Eggert

Periophthalmus variabilis Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 63, figs. 5-8, pl. 3 fig. 13, pl. 4 figs. 14, 15.
Periophthalmus variabilis Koumans, Mem. Indian Mus. 13, 1941, p. 289.

D. 1 IX-X; D. 2 I. 12-13; A. I. 12; P. 11; L.l. 60-75; L.tr. 1 ± 17; L.tr. 2 12-13; Predorsal scales ± 25.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 6-7 in total length. Head truncate, $4^1/_2$-5 in total length. Teeth in upper jaw anteriorly 2-3 caninoid ones; in lower jaw on each side 1-3 caninoid teeth. First dorsal fin concave, convex posteriorly. Second dorsal fin lower than the first. Anal fin lower than second dorsal fin. Basal membrane of ventral fin moderate to weak, the two halves of the fin are united by a narrow membrane along the inner rays. Caudal fin obtuse, obliquely rounded, about as long as head. Length 85 mm.

Eggert, l.c., described 4 new subspecies, which we have not seen among the specimens, which we studied from the Indo-Australian Archipelago, from where 3 of them are recorded.

These 3 subspecies are, according to Eggert, distinguished by:

a. D. 1 nearly equilateral triangular, in front with slightly concave, behind with convex margin, with light reticular markings on basal half. L.l. 60-65. *P. variabilis variabilis* Eggert.

b. D. 1 in front third part concave, behind this convex, foremost rays are a little prolonged, or fin prolonged triangular. L.l. 70-75. *P. variabilis sumatranus* Eggert.

c. D. 1 in front slightly concave, behind this convex, with white margin, which becomes narrower backwards and is absent on the three posterior membranes. Rays and tip of the rays dark. A broad blackish brown band, which becomes backwards narrower, and is absent on the last membrane, separated from the brown base by a row of narrow longitudinal blotches. Posterior basal part with numerous blotches, arranged in the direction of the rays. *P. variabilis tidemani* Eggert.

P. variabilis variabilis Eggert, o.c. p. 64, fig. 5, pl. 3 fig. 13.

Habitat: Java (Tjilatjap).

P. variabilis sumatranus Eggert, o.c. p. 65, fig. 6, pl. 4 figs. 14, 15.

Habitat: Sumatra (Belawan, Baknan Brandan, Deli river, Padang, Mentawei Islands); Java (Djakarta).

P. variabilis tidemani Eggert, o.c. p. 67, fig. 8.

Habitat: Halmaheira (Pulu Babu).

Note: We have seen of *P. variabilis* 3 specimens from British India (Ennur, Vizagapatam), but could not bring them into a subspecies.

6. **Periophthalmus harmsi** Eggert

Periophthalmus harmsi Eggert, Zeitschr. wiss. Zool. 133, 1928, pp. 398, 402. — Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 69, pl. 4 figs. 16, 17.

D. 1 XIII-XIV; D. 1 I. 11; A, I. 10; P. 13; L.l. 80-90.

Height of body 7 in total length. Head compressed, $4^1/_2$-5 in total length. Teeth in upper jaw in one row, in front some caninoid teeth. First dorsal fin slightly convex to concave; last ray connected with the back by a slightly concave membrane. The posterior margin is nearly parallel to the frontmargin. First dorsal fin higher than long, the first ray is shorter than the 3-5 following ones. First ray of second dorsal fin a little higher than half the height of body below it, and higher than anal fin. Pectoral fin a little longer than head. Ventral fins united by a membrane to $^1/_4$ or $^1/_3$ of their length, this membrane extends to halfway the inner rays of the fin. Basal membrane weak. Colour in spirits graybrown with dark blotches, forming indistinct transverse stripes. Lower part of body light, with short, shiny white, transverse stripes upward. Head below, and in middle and front of opercle with light blotches. First dorsal fin light brown gray, with white margin, below which a black band, interrupted by narrow gray transverse stripes, from first ray to caudal part of base; this band becomes narrower posteriorly. Anterior half of membrane with black, posterior half with dark brown stripes in the direction of the rays, joining at the base. Caudal part with oblong, narrow white specks on the rays and in the membrane. Rays of second dorsal fin brown gray, with white spots. In upper half a black longitudinal band, which is bordered by white specks. The band becomes brown gray in the posterior part, where it has the same colour as the base. Base grown gray with white specks, which are arranged in short irregular oblique rows. Anal fin hyaline white. Caudal fin with light membranes and oblique stripes, composed of gray brown spots on the rays. Pectoral fin with gray brown minute spots. Ventral fin white with short dark stripes on the rays. Length 130 mm.

Habitat: Java (Pulu Popole).

After Eggert, not seen by us.

7. **Periophthalmus koelreuteri** (Pall.)

Gobius koelreuteri Pallas, Spicilegia Zool. 8, 1770, p. 8, pl. 2 figs. 1-3.
Gobius koelreuteri Gmelin in Linnaeus, Syst. Nat. ed. 13, 1788, p. 1205.

Periophthalmus koelreuteri Bloch ed. Schneider, Syst. Ichth. 1801, p. 65.
Periophthalmus kalolo Lesson, Voy. Coquille Zool 2 (1), 1830, p. 146.
Periophthalmus kalolo Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 181.
Periophthalmus koelreuteri var. *koelreuteri* Günther, Cat. Fishes 3, 1861, p. 97.
Periophthalmus koelreuteri Day, Fishes India 1878, p. 303, pl. 64 fig. 8. — Fauna Brit. India Fishes 2, 1889, p. 280, fig. 95.
Periophthalmus koelreuteri M. Weber in Semon, Zool. Forschungsreisen 5, 1895, p. 271.
Periophthalmus koelreuteri M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 45 (pro parte).
Periophthalmus koelreuteri M. Weber, Siboga Exp. Fische 1913, p. 484 (pro parte).
Periophthalmus koelreuteri De Beaufort, Bijdragen Dierkunde 1913, p. 147 (pro parte).
Periophthalmus koelreuteri var. Eggert, Zeitschr. wiss. Zool. 133, 1928, p. 403, pl. 9 fig. 4.
Periophthalmus koelreuteri Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 70, figs. 9-11, pl. 5 figs. 18-21.
Periophthalmus koelreuteri Koumans, Mem. Indian Mus. 13, 1941, p. 289.

D. 1 X-XVII; D. 2 I. 11; A. I. 10-11; P. 13; L.l. 70-90; L.tr. 1 17; L.tr. 2 12-13; Predorsal scales ± 35.

Body elongate, height 6-7$^1/_3$ in total length. Head truncate, 4$^1/_2$-5 in total length. Teeth in front caninoid, laterally smaller. Dorsal fins separate. First dorsal fin convex, the first ray is generally a little shorter than the following ones. Anal fin lower than second dorsal fin. Basal membrane of ventral fin moderate to weak. Inner rays of ventral fin only united at the base by a narrow membrane, which is deeply emarginate. Caudal fin obliquely truncate. Colour brownish to blackish brown, lighter below. On body irregular transverse bands. Opercle with light dots on lower half. Sometimes shiny spots on body. First dorsal fin light brown to dark brown, margin white. Base with white dots. Second dorsal fin with broad white margin, a dark brown submarginal band, below which short dark stripes, bordered with white. Anal fin white. Length 150 mm.

Eggert, o.c. states 5 subspecies, 3 of which are new. Of these subspecies, *koelreuteri, albostriatus, velox* and *kalolo* are recorded from the Indo-Australian Archipelago. The subspecies *kalolo* seems to be the most abundant, as all specimens we examined from the Archipelago belong to it, except a few, of which the subspecies could not be identified. Eggert distinguishes the 4 subspecies from the Archipelago as follows:

a. D. I X-XII, dark brown to black with narrow white margin, below which a dark stripe, narrowing backwards. On the rays light dots, which are in the posterior part not always placed in distinct rows. Body light to dark gray. L.l. 80-90. Total length 13-15 cm. *P. koelreuteri koelreuteri* Pallas.

b. Light to dark gray with minute dark reticulated markings. D. I XVI-XVII, with narrow light margin, below it a dark band, sometimes interrupted by light transverse stripes. Base black brown, with long white stripes on the membranes. L.l. 80-85. Total length 13-15 cm. *P. koelreuteri albostriatus* Eggert.

c. Light gray, with broad dark, ventralwards narrowing oblique stripes. D. I XII-XV, with broad white margin, below it a black longitudinal band, bordered at its ventral side by a broad white band. Base light brown, hyaline, with many white specks, arranged in rows. L.l. 80-90. Total length 10-11 cm. *P. koelreuteri velox* Eggert.

d. Light to dark brown, with indistinct black markings, often with pearly spots and stripes. D. I XI-XV, with white margin, below it a black longitudinal band, often interrupted by dark brown transverse stripes. The black band is separated from the base by a row of more or less distinct white dots. Base hyaline, light gray to gray brown, with many white specks, which are sometimes absent. L.l. 70-90. Total length 10-11.5 cm 1). *P. koelreuteri kalolo* Lesson.

P. koelreuteri koelreuteri Eggert, o.c. p. 72, fig. 9, pl. 5 fig. 18.

Habitat: Java (Bay of Djakarta: Island Edam, Island Kerkhof).

P. koelreuteri albostriatus Eggert, o.c. p. 73, fig. 10.

Habitat: Java (Pulu Popole).

P. koelreuteri velox Eggert, o.c. p. 75.

Habitat: Java (Bay of Djakarta: Island Amsterdam).

P. koelreuteri kalolo Eggert, o.c. p. 76, fig. 11, pl. 5 figs. 19, 20.

Habitat: Sumatra (Padang); Simalur (Sinabang!); Nias (Labewa!); Java (Labuan, Tjilatjap, Kangeang!, Djakarta!); Flores (Labuan Badjo!, reef of Pulu Wèrè in Riung bay!); Timor!; Celebes (Paré Paré!); Togian Islands; Talaud Islands (Beo!); Ternate!; Obi latu!; Ambon!; Haruku!; Saonek!; Kafal near Misol!; Aru Islands (Dobo!); New Guinea (Hollandia!, Skroë!). — Madagascar!, Red Sea!, Andamans!, South Sea!, Australia (Port Darwin!); Oualan, New Ireland, Samoa, Fiji Islands.

---

1) We have seen specimens of 145 mm total length. The figure 11 on p. 76 of Eggert is badly drawn, as the branches of the inner rays of the fin are not indicated.

We found specimens, which we could not bring to a subspecies from Java (Besoeki!, Krawang!) and from Mentawei Islands (Island Sipora!). Further from India (mouth of river Hughly!), Andamans! and Nicobars!.

8. **Periophthalmus gracilis** Eggert

Periophthalmus argentilineatus var. G Eggert, Zeitschr. wiss. Zool. 133, 1928, p. 409-410 (not of C.V.).
Periophthalmus gracilis Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 79, pl. 6 fig. 22.

D. 1 IX-XII; D. 2 I. 10-11; A. I. 10-11; P. 10; L.l. 70-80; L.tr. 17; Predorsal scales ± 30.

Height of body 7-7$^1/_2$ in total length. Head a little compressed, 5-5.3 in total length. Teeth small, in one row in upper jaw, unequal of size. First dorsal fin relatively small, convex, height of fin $^3/_4$ of height of body. Second dorsal fin lower than the first, but higher than anal fin. The two halves of ventral fin are nearly separated, basal membrane very weak, developed as a transversal rail on the base of the fin. Colour in spirits light to dark brown, with broad irregular black oblique stripes, sometimes consisting of blotches, running till below middle of the side. Belly lighter, with short, pearly bands, running upward, but not reaching the middle of the side, or divided into spots on the back. Opercle with pearly spots, which may form in the front part short stripes. First dorsal fin with broad white margin, narrowing posteriorly; below it a darkbrown longitudinal band, in front part interrupted by the light rays, in back part becoming black, forming a dark black blotch posteriorly on first dorsal fin. Base of the fin gray brown with white spots; above it a row of white spots. Second dorsal fin with white margin, and longitudinal light brown to blackbrown band. Base white with oblique stripes, consisting of brown spots. Anal fin colourless. Ventral fin white with dark rays. Caudal and pectoral fin of the same colour as body, rays spotted. Length 56 mm.

Habitat: Sumatra (Siboga); Nias (Labewa!); Java (Djakarta, Tjilatjap, Nusa Kambangan!).

9. **Periophthalmus vulgaris** Eggert

Periophthalmus argentilineatus Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 276 (not of C.V.).
Periophthalmus koelreuteri M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 262 (pro parte).

Periophthalmus koelreuteri var. *argentilineatus* McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 194, pl. 31 fig. 1 (not of C.V.).
Periophthalmus koelreuteri Rendahl, Medd. Zool. Mus. Kristiania 5, 1922, pp. 165, 195 (not of Pall.).
Periophthalmus argentilineatus Gruppe A Eggert, Zeitschr. wiss. Zool. 133, 1928, p. 406, pl. 9 fig. 7b (not of C.V.).
Euchoristopus kalolo regius Whitley, Australian Zoologist 6, 1931, p. 325.
Periophthalmus vulgaris Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 80, pl. 6 figs. 23-26, pl. 7 figs. 27-30,
Periophthalmus dipus angustiformis Eggert, o.c. p. 89, fig. 14 (pro parte).
Periophthalmus vulgaris Koumans, Mem. Indian Mus. 13, 1941, p. 290.

D. 1 X-XVII; D. 2 I. 10-12; A. I. 10-11; P. 13; L.l. 70-95; L.tr. 1 17; L.tr. 2 13; Predorsal scales ± 35.

Body elongate, height 5.7-7.3 in total length. Head truncate, 4.2-5.1 in total length. Teeth in front a little enlarged, laterally small. Dorsal fins separate. First dorsal fin concave, posteriorly convex, the first ray is the longest. Anal fin lower than second dorsal fin. Basal membrane of ventral fin very weakly developed or absent. The two halves of the fin are nearly separated, a very narrow membrane is mostly present. Caudal fin obliquely rounded. Colour light brown to blackish brown, light below. On ventral part of body shiny transverse stripes, on dorsal part dark oblique stripes. First dorsal fin with broad white margin, below it a broad black submarginal band, below which a white stripe, or a row of white dots. Base grayish with white dots. Second dorsal fin with broad white margin, below which a lightbrown to darkbrown longitudinal band. Base grayish to lightbrown, with white markings. Anal fin uncoloured. Length 105 mm.

Eggert, o.c. states 4 subspecies, 3 of which are new. Of these subspecies *vulgaris, notatus* and *ceylonensis* are known from the Indo-Australian Archipelago. Eggert distinguishes them as follows:

a. Basal membrane of ventral fin slightly indicated or absent. D. 1 X-XVII, base brown with white specks in a longitudinal row, or some oblique rows. Longitudinal band brown to black, bordered by white stripes; the band has on the 2-3 foremost membranes a black blotch. L.l. 75-85. Total length 6-9 cm. *P. vulgaris vulgaris* Eggert.

b. Basal membrane of ventral fin absent, D. 1 XIII, base light gray with white specks; longitudinal band gray, bordered by white stripes. The band forms on the three foremost membranes on each membrane a black blotch, and becomes darker posteriorly. L.l. ± 65. Total length 7 cm. *P. vulgaris notatus* Eggert.

c. Basal membrane of ventral fin absent. D. 1 XIII-XVII, base lightbrown with white specks; longitudinal band lightbrown, narrowing posteriorly, bordered by white stripes. The band forms in the three foremost membranes on each membrane a large black blotch, on the posterior membranes the band is indistinct, or even absent. L.l. 85-95. Total length 5.8-6 cm. *P. vulgaris ceylonensis* Eggert.

P. vulgaris vulgaris Eggert, o.c. p. 81, pl. 6 figs. 23-26, pl. 7 figs. 27-28.

Nom. indig.: Seh telat (Buru).

Habitat: Pulu Weh!; Banka; Sumatra (Siboga, Sibirut, Padang!, Tandjong, Priaman, Brandewijns bay!); Simalur (Sinabang!, Lasikin!); Nias (Labewa!); Java (Djakarta, Pagandaran, Bantam, Tjerita, Wijnkoops bay, Labuan, Tjilatjap, Besoeki!, Puger!); Strait Madura!; Lombok (Ekos, Labuan Hadji); Sumbawa (Bima!); Flores (Mbawa! [1]); Adonare (Sagu!); Timor (Atapupu); Borneo (Balikpapan!); Celebes (Dongala!, Makassar!, Paré Paré!); Togian Islands; Salibabu (Lirung!); Talaud Islands (Beo!); Halmahera (Sidagnoli); Ternate; Batjan; Buru (Wa' Tina!); Ceram (Kairatu!, Wahai!); Ambon!; Saparua; Banda!; Waigeu; Saonek!; Aru Islands (Tenuabarri!, Wengil on Wammer!, Enu!, Dobo, Pulu Belading). — Australia (Fife bay!).

P. vulgaris notatus Eggert, o.c. p. 83, pl. 7 fig. 29.

Habitat: Pulu Klappa (Sungei).

P. vulgaris ceylonensis Eggert, o.c. p. 85.

Habitat: Singapore!. — Ceylon.

Note: We have seen in the Indian Museum specimens, which doubtless belong to *P. vulgaris*, but of which the subspecies was not clear to us. These specimens were collected in Vizagapatam to Burma, Andamans and Siam.

10. **Periophthalmus dipus** Blkr.

Periophthalmus melanotaeniatus Kuhl & v. Hasselt, Museum name in Leiden Museum.

---

1) This specimen is the female of *P. dipus angustiformis* of Eggert, l.c. p. 89, fig. 14. Of this described subspecies, the male belongs to *P. dipus dipus*, the female to *P. vulgaris vulgaris*. It has L.l. 86; L.tr. 1 20; L.tr. 2 17; Predorsal scales ± 35, and agrees, except in the somewhat higher number of scales in L.tr. 1 and L.tr. 2, with *P. vulgaris vulgaris*. The black band on first dorsal fin is also developed on the first membrane, therefore the figure 14 is erroneous in this point.

Periophthalmus koelreuteri Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, p. 252 (not of Pall.).
Periophthalmus dipus Bleeker, o.c. 7, 1854, p. 320.
Periophthalmus koelreuteri var. β Günther, Cat. Fishes 3, 1861, p. 98 (not of Pall.).
Periophthalmus dipus Eggert, Zeitschr. wiss. Zool. 133, 1928, p. 403, pl. 9 fig. 5.
Periophthalmus dipus Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 86, figs. 12-14, pl. 8 figs. 31-32.
Periophthalmus minutus Eggert, o.c. p. 90, figs. 15-16, pl. 8 fig. 33.
Periophthalmus dipus Koumans, Mem. Indian Mus. 13, 1941, p. 291.

D. 1 X-XII; D. 2 I. 11; L.l. ± 70; L.tr. 1 17; L.tr. 2 11-12; Predorsal scales 25.

Body elongate, height $5^1/_2$-7 in total length. Head about $4^1/_2$ in total length. Snout truncate. Teeth in both jaws 10-12, in upper jaw no canines, in lower jaw anterior teeth caninoid. Scales of body a little larger posteriorly. Dorsal fins nearly continuous at the bases. First dorsal fin a little convex, first ray is shorter than the second; second and third rays about as high as body. Second dorsal fin lower than the first, higher than anal fin. Ventral fin without basal membrane, the two halves of the fin are separated till the base. Colour after a drawing of Bleeker bluish brown with dark blotches, belly lighter. Head and body with shiny spots. First dorsal fin yellowish orange, with a faint brown band below the margin; on the base a number of shiny spots. Second dorsal fin yellowish orange, with black longitudinal band, bordered with white. Caudal fin bluish brown, yellowish in its upper part. Rays of pectoral and ventral fin spotted. Anal fin greenish yellow. Length 120 mm.

Eggert, o.c. describes 3 subspecies of *P. dipus,* 2 of which are new. Of these, *P. dipus angustiformis* was stated from the type, a male and a female. In studying these specimens from the collection of the Amsterdam Museum, we found a great difference between the male and the female. The female is regarded to belong to *P. vulgaris vulgaris,* the male agrees fully with *P. dipus dipus.* The described species *P. minutus,* we can only see as young specimens of one of the subspecies of *P. dipus,* probably *P. dipus parvus,* which subspecies we have not seen. The two subspecies of *P. dipus* are distinguished by Eggert as follows:

a. D. 1 in female convex, first ray shorter than base of D. 1. L.l. ± 60. Total length 5.5 cm. *P. dipus parvus* Eggert.

b. D. 1 in female convex, first ray shorter than base of D. 1. L.l. 65-70. Total length 7-10 cm. *P. dipus dipus* Bleeker.

P. dipus dipus Eggert, o.c. p. 87, figs. 12-13, pl. 8 fig. 31.

Nom indig.: Blodo (Sundan.), Seh tilat (Buru), Glodok tutul (Jav.).

Habitat: Sumatra (Benkulen, Padang!, Air bangis!, Labuan batu!); Mentawei Islands (Siberut); Simalur (Sinabang!); Nias (Gunung Sitoli!, Labewa!); Java! (Tjiringin, Padangdaran, near Labuan, Tjilatjap!); Flores (Larantuka, Mbawa!); Borneo!; Celebes (Palima!); Buru (Wa' Tina!). — Andamans!.

P. dipus parvus Eggert, o.c. p. 88, pl. 8 fig. 32.

?*P. minutus* Eggert, o.c. p. 90, figs. 15, 16, pl. 8 fig. 33.

Habitat: Sumatra (Belawan, ?Deli river, ?Brandan).

11. **Periophthalmus argentilineatus** C. V.

Periophthalmus argentilineatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 191.

Periophthalmus koelreuteri var. γ Günther, Cat. Fishes 3, 1861, p. 98.

Periophthalmus koelreuteri M. Weber, Siboga Exp. Fische 1913, p. 484 (pro parte, not of Pall.).

Periophthalmus koelreuteri De Beaufort, Bijdragen Dierkunde 1913, p. 147 (pro parte, not of Pall.).

Periophthalmus argentilineatus var. F. and G. Eggert, Zeitschr. wiss. Zool, 133, 1928, p. 409.

Periophthalmus argentilineatus Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 91, pl. 8 figs. 34-35, pl. 9 fig. 36.

D. 1 XII-XVI; D. 2 I. 9-10; A. I. 8-11; P. 11-13; L.l. 70-90; L.tr. 1 17-18; L.tr. 2 12-15; Predorsal scales 30-35.

Height of body $6^1/_2$-$7^1/_2$ in total length. Head $4^1/_2$-5 in total length. Teeth in upper jaw in one row, equal of length, in front enlarged, gradually decreasing in size laterally. In lower jaw more unequal of size, on each side 2 to more caninoid teeth. First dorsal fin convex, foremost rays as long as, or longer than height of body. Second dorsal fin a little higher than anal fin. The two halves of the ventral fin are separated to the base, a very narrow membrane may be present. Basal membrane is absent. Colour of belly light with narrow pearly stripes running upward. Pearly spots on ventral side of opercle.

Eggert, o.c. describes 2 subspecies, one of them is new. These subspecies are described by Eggert as follows:

a. L.l. 80-90. Base of first dorsal fin hyaline brown, with some rows of white spots, sometimes only developed on 3-4 foremost membranes. Total length 6-8.4 cm. *P. argentilineatus argentilineatus* C.V.

b. L.l. 70. Base of first dorsal fin darkbrown with 5-6 oblique stripes of white spots, forming in the posterior part confluent bands, in front part interrupted by the dark finrays. Total length 6.5 cm. *P. argentilineatus striopunctatus* Eggert.

P. argentilineatus argentilineatus Eggert, o.c. p. 93, pl. 8 figs. 34, 35.

Habitat: Banka!; Sumatra (Padang, Brandewijns bay!); Mentawei Islands (Siberut, Sipura); Java (Wijnkoops bay, Besoeki!, Puger!); Lombok (Labuan Tring!); Celebes (Gorontalo!); Salibabu (Lirung!); Halmahera (Gebe!); Ternate; Tidore; Obi latu!; Nusa Laut!; Ambon!; Saparua; Banda!; Waigeu!; Saonek!.

P. argentilineatus striopunctatus Eggert, o.c. p. 94, pl. 9 fig. 36.

Habitat: Adonare (Sagu!); Borneo (Balikpapan).

2. **Periophthalmodon** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 326)

Body elongate, a little compressed, covered with 45-60 cycloid scales. Head compressed, entirely scaled. Eyes close together, and prominent above the dorsal profile. Lower eyelid well developed. Snout blunt, a little longer than eye. Anterior nostril in a tube in a triangular lobule. Mouth horizontal, jaws equal. Teeth in upper jaw in two rows, the outer row has the anterior teeth enlarged, caninoid; inner row smaller. In lower jaw one row of teeth, partly

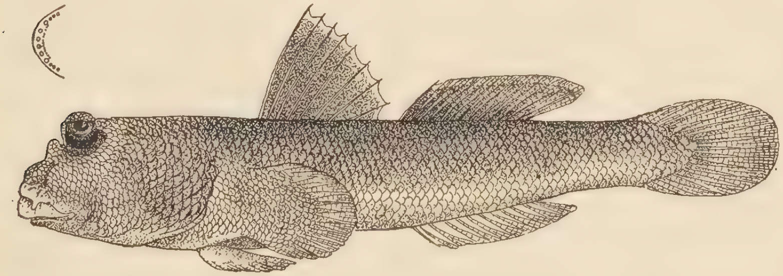

Fig. 51. *Periophthalmodon Schlosseri* (Pall.) × ½.

caninoid. Tongue rounded, nearly totally adnate to the floor of the mouth. Gillopenings narrow, placed before the lower $^3/_4$ of pectoral fin, isthmus broad. Dorsal fins close together. First dorsal fin absent, or 3-14 rays. D. 2 I. 11-14; A. I. 11-13. Ventral fins nearly totally united, infundibuliform, a low basal membrane is developed, or only united with their bases, not infundibuliform, the rays completely separated. Pectoral fin with a muscular base. Caudal fin asymmetrical, the dorsal rays longer than the ventral ones, oblong.

Distribution: India to Australia.

Key to the Indo-Australian species of Periophthalmodon

1. Ventral fins totally united; basal membrane well developed . . . . 1. *P. schlosseri* p. 216.
2. Ventral fins nearly separate, only a narrow membrane at the base; basal membrane absent . . . . 2. *P. tredecemradiatus* p. 218.

1. **Periophthalmodon schlosseri** (Pall.) (Fig. 51, p. 215)

Gobius Schlosseri Pallas, Spicilegia Zool. 8, 1770, p. 3, pl. 1 figs. 1-4.
Gobius Schlosseri Gmelin in Linnaeus, Syst. Nat. ed. 13, 1788, p. 1201.
Periophthalmus Schlosseri Bloch ed. Schneider, Syst. Ichth. 1801, p. 64.
Periophthalmus ruber Bloch ed. Schneider, o.c. p. 64.
Gobius septemradiatus Hamilton Buchanan, Gangetic Fishes 1822, p. 46.
Periophthalmus Schlosseri Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 192.
Periophthalmus septemradiatus Cuvier & Valenciennes, o.c. p. 196.
Periophthalmus Freycineti Cuvier & Valenciennes, o.c. p. 197.
Periophthalmus Schlosseri Bleeker, Verh. Bat. Gen. 22, 1849, p. 39.
Periophthalmus Schlosseri Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1173.
Periophthalmus schlosseri Günther, Cat. Fishes 3, 1861, p. 110 (pro parte).
Periophthalmus australis Castelnau, Res. Fish. Australia (Vict. Offic. Rec. Philad. Exhib.) 1875, p. 22.
Periophthalmus australis Alleyne & Macleay, Proc. Linn. Soc. N.S. Wales 1, 1877, p. 334, pl. 11 fig. 3.
Periophthalmodon schlosseri Fowler, Proc. Ac. Nat. Sci. Philadelphia 57, 1905, p. 513.
Periophthalmodon Schlosseri Jordan & Seale, Bull. Bur. Fisheries 26, (1906) 1907, p. 40.
Periophthalmodon Schlosseri M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 602 (pro parte).
Periophthalmodon barbarus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 197, pl. 31 fig. 2.

Periophthalmodon schlosseri Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 320.
Periophthalmus schlosseri Eggert, Zeitschr. wiss. Zool. 133, 1928, p. 398, pl. 8 fig. 3. — Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 45, pl. 1 figs. 1-3.
Periophthalmus schlosseri Koumans, Mem. Indian Mus. 13, 1941, p. 291.

D. 1 III-X; D. 2 I. 12-13; A. I. 11-12; P. 16-20; L.l. 50-60; L.tr. 1 14; L.tr. 2 12; Predorsal scales 22-23.

Body elongate, height about 6 in total length. Head about 4 in total length. Teeth in upper jaw in two rows, outer row 10-12 canines in front, inner row 2-4 smaller teeth. First dorsal fin convex, even when reduced, not higher than body. Second dorsal and anal fin lower than body. Ventral fins totally united, sometimes emarginate posteriorly; basal membrane well developed. Caudal fin obliquely rounded. Colour dark brown, lighter below. Blue spots or shiny spots on head and body. From eye to shoulder a darkbrown band. First dorsal fin yellowbrown to darkbrown with light margin. Second dorsal fin lightbrown to darkbrown with brown, dark longitudinal band in middle of the fin. Ventral and anal fin yellowish. Length 270 mm.

Eggert, o.c. describes 4 subspecies of *Periophthalmodon schlosseri,* one of which is new. They are distinguished by Eggert as follows:

a. D. 1 VI-IX, fan-like, its height is smaller than or at most as long as its base, which is 1½-4 times the distance from first to second dorsal fin. Body darkbrown, ventral side lighter, with blue spots. *P. schlosseri schlosseri* Pall.).

b. D. 1. VII-IX, fan-like, its heigtth is smaller than or at most as long as its base, which is 2-3 times the distance from first to second dorsal fin. Back darkbrown, sides silvery with pearly spots, on head arranged in concave rows. *P. schlosseri argentiventralis* Eggert.

c. D. 1 III-V, its height is 1½-2 times the length of its base, which is $^{1}/_{2}$-$^{2}/_{5}$ of the distance from first to second dorsal fin. Body darkbrown, belly lighter with a few light blue spots ventrally. *P. schlosseri australis* Castelnau.

d. D. 1 IV-V, its height is $2^{1}/_{2}$-5 times the length of its base, which is $^{1}/_{5}$-$^{2}/_{7}$ of the distance from first dorsal to second dorsal fin. Body darkbrown, belly lighter, with a few light blue spots ventrally. *P. schlosseri freycineti* C.V.

P. schlosseri schlosseri Eggert, o.c. p. 47, pl. 1 fig. 1.

Nom. indig.: Gabus lawut (Mal.), Blodok (Jav.), Tempakul (Samarinda).

Habitat: Singapore; Bedok!; Changi; Pulu Obi; Pulu ayer Merbau; Banka; Sumatra (Batu bahra, Bagan Deli, Pulu Brandan, mouth Mesudji!, river Betsch!); Java (Anjer, Djunkulon, Labuan, Djakarta!, Semarang, Surabaja, Tjilatjap); Madura (Pamekasan!, Branta!); Borneo! (Sinkawang, Sungiduri, Baram!, Padang Tikar bay, Samarinda); Celebes (Makassar!); Ambon; Waigeu; New Guinea. — India (Off Hingi Basin!), Malay States (Penang, Kuala Langat, Pulu lalang!), Siam, Queensland (Burdekin river!).

P. schlosseri argentiventralis Eggert, o.c. p. 49.

Habitat: Java (Bay of Djakarta: Island Edam).

P. schlosseri australis Eggert, o.c. p. 50, pl. 1 fig. 2.

Habitat: Aru Islands (Dobo). — Australia.

P. schlosseri freycineti Eggert, o.c. p. 50, pl. 1 fig. 3.

Habitat: Timor (river Babao); New Guinea (Fak Fak!, Merauke, Utumbuwe river, Noord river, Lorentz river).

2. **Periophthalmodon tredecemradiatus** (H. B.)

Gobius tredecemradiatus Hamilton Buchanan, Gangetic Fishes 1822, p. 48.
Periophthalmus tredecemradiatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 189.
Periophthalmus borneensis Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, p. 11.
Periophthalmus 13-radiatus Blyth, Journ. Asiat. Soc. Bengal 29, 1861, p. 148.
Periophthalmus schlosseri Day, Fishes India 1878, p. 304, pl. 66 fig. 4 (not of Pall.). — Fauna Brit. India Fishes 2, 1889, p. 281 (not of Pall.).
Periophthalmus chrysospilos Volz, Zool. Jahrb. Syst. 19, 1903, p. 362 (not of Blkr.).
Periophthalmus schlosseri var. *freycineti* Volz, o.c. p. 362 (not of C.V.).
Periophthalmus tredecemradiatus Eggert, Zool. Jahrb. Syst. 67 Heft 1/2, 1935, p. 51, pl. 1 fig. 4, pl. 2 fig. 5.
Periophthalmus tredecemradiatus Koumans, Mem. Indian Mus. 13, 1941, p. 292.

D. 1 X-XIV (female O-VI); D. 2 I. 11-13; A. I. 10-11; P. 12-13; L.l. 45-60.

Body elongate, height 6-$7^1/_2$ in total length. Head $4^1/_3$-5 in total length. Teeth small, in upper jaw in two rows, anterior teeth caninoid. First dorsal fin concave, in female very reduced to absent. First ray in male filiform. Ventral fins nearly separated, only a very narrow membrane at the base; basal membrane absent. Caudal fin obliquely rounded.

Eggert, o.c., describes two subspecies, which he distinguishes as follows:

a. L.l. 45-50. Body more cylindrical. D. 1 male with concave margin and long base, first ray prolonged, filiform. D. 1 in female very small to absent. Total length 7.2-9.2 cm. *P. tredecemradiatus tredecemradiatus* (H.B.).

b. L.l. 50-60. Body strongly compressed. D. 1 in male with concave margin and long base, first ray prolonged, filiform. D. 1 in female very small, but never absent. Total length 8.5-10.2 cm. *P. tredecemradiatus borneensis* Blkr.

P. tredecemradiatus tredecemradiatus Eggert, o.c. p. 52, pl. 1 fig. 4, pl. 2 fig. 5.

Habitat: Sumatra (opposite Banka!, Banjuasin!). — India (Uttarbhag in Bengal!, Burma!, Sungei Buangu Klang!, Bassein), Andamans!, Siam (Bangkok!).

P. tredecemradiatus borneensis Eggert, o.c. p. 54.

Nom. indig.: Blodok (Bandjermasin), Tempakul.

Habitat: Borneo (Sambas, Bandjermasin, Pontianak, Upper Riko!, Samarinda!, Padang Tikar bay!). — In rivers.

Type of *Periophthalmus borneensis* seen in the Leiden Museum.

4. Subfamily SICYDIAPHIINAE

Body elongate, scaly or naked. Gillopenings not very wide, except in *Aphia*, isthmus broad. Two dorsal fins, the second is not elongated. Ventral fins united, either only with the bases, either wholly attached to the belly. Sometimes labial teeth in lower lip. In lower jaw a single row of simple teeth. In upper jaw a row of teeth, behind which sometimes some rows hidden in the gum. Head elongate. Snout and cheek naked.

Distribution: All over the world.

Key to the Indo-Australian species of Sicydiaphiinae

1. Ventral fins forming together a sucking disk, which is attached to the belly. Body scaled. At least one canine on each side behind symphysis of lower jaw . . . . 1. *Sicyopterus* p. 220.

2. Ventral fins united, but not adherent to the belly.
  a. Labial teeth in lower lip.
    a'. Teeth in upper jaw closely set, more or less tricuspid. . . . . 2. *Stiphodon* p. 235.
    b'. Teeth in upper jaw not tricuspid.

α. Teeth in upper jaw uneven, partly caninoid. L.l. ± 25 . . . . 3. *Pleurosicya* p. 237.
β. Teeth in upper jaw slender, hooked, no canines. L.l. 32-55 . . . . 4. *Sicyopus* p. 238 1)
b. No labial teeth in lower lip.
  a′. Two canines in lower jaw. Cleft of mouth nearly vertical. D. 1 V-VI . . . . . . 5. *Gobiopterus* p. 242.
  b′. No canines in lower jaw.
    α. Cleft of mouth oblique. D. 2 and A. subtriangular, acute . . . . 6. *Leptogobius* p. 245.
    β. Cleft of mouth nearly horizontal. D. 2 and A. obtuse. . . . . 4. *Sicyopus* p. 238.

1. **Sicyopterus** Gill

(Gill, Proc. Ac. Nat. Sci. Philadelphia 1860, p. 101)

Cotylopus Guichenot in Maillard, Notes sur l'Isle de la Réunion 2 add. C, 1864, p. 9.
Sicydiops Bleeker, Arch. neerl. sc. ex. nat. 9, 1874, p. 314.
Microsicydium Bleeker, o.c. p. 314.
Bryanina Fowler, Occ. Pap. B.P. Bishop Mus. 9 no. 25, 1932, p. 10.

Body elongate, nearly cylindrical to a little compressed, covered with about 50-80 small scales, ctenoid on the posterior part of body, cycloid on the anterior part. Head a little depressed, scaled above behind the eyes, cheek naked. Mouth nearly horizontal, upper jaw prominent. Lower lip with a series of numerous slender, horizontal teeth. Upper jaw with a single row of numerous movable teeth. Lower jaw with a row of widely set, conical teeth, a pair of canines behind symphysis. All teeth in upper jaw are simple, slender, the distal half bent inward, nearly at a right angle. No barbels on head. Eyes of moderate size. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 10-12. Caudal fin free, obtuse. Ventral fins united

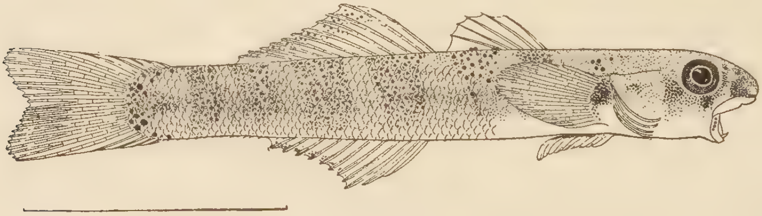

Fig. 52. *Sicyopterus gymnauchen* (Blkr.). × $3^{3}/_{5}$.

---

1) In *Sicyopus* the labial teeth are nearly absent, at least in preserved specimens. In *S. balinense*, however, some labial teeth are found.

into a short, cup-shaped disk, which is attached to the belly; the rays are short and with many ramifications in a short distance. Gillopenings of moderate width.

Distribution: Madagascar to the Pacific.

Key to the Indo-Australian species of Sicyopterus

1. Upper lip entire, without clefts, papillae along the lower margin present.
A. L.l. 66-68; L.tr. 19; Predorsal scales 25. Scales of anterior part of body smaller than the scales on the sides and the caudal peduncle. . . . . . 1. *S. hageni* p. 222.
B. L.l. 60-70; L.tr. 15-16; Predorsal scales 20. Scales of anterior part of body smaller than the scales on the sides and the caudal peduncle . . . 2. *S. microcephalus* p. 223.
2. Upper lip entire, without clefts, inner margin of lip rugose, but without papillae on the gum.
A. L.l. 52-55 (12 deciduous cycloid + ± 40 ctenoid scales); L.tr. 14-15; Predorsal scales 11-12 deciduous scales. Caudal fin slightly emarginate. Scales of anterior part of body equal to the scales on the sides and the caudal peduncle . . . . 3. *S. gymnauchen* p. 224.
B. L.l. 65; L.tr. 17; Predorsal scales ± 24. Caudal fin rounded. Scales of anterior part of body smaller than the scales on the sides and the caudal peduncle . . . . 4. *S. wichmanni* p. 226.
3. Upper lip cleft.
A. Upper lip with a median cleft and two lateral clefts, inner margin of upper lip with papillae.
a. More than 65 scales in L.l.
a'. L.l. 75-80; L.tr. 17; Predorsal scales 35. Scales of anterior part of body smaller than the scales on the sides and the caudal peduncle . . . . 5. *S. cynocephalus* p. 226.
b'. L.l. 70; L.tr. 17-18; Predorsal scales 30. Scales of anterior part of body smaller than the scales on the sides and the caudal peduncle . . . . 6. *S. parvei* p. 228.

b. Less than 65 scales in L.l.
  a'. L.l. 50; L.tr. 14-15; Predorsal scales 18. Scales of anterior part of body larger than the scales on the sides and the caudal peduncle . . . . 7. *S. macrostetholepis* p. 228.
  b'. L.l. 55-60; L.tr. 15-16; Predorsal scales 24. Scales of anterior part of body larger than the scales on the sides and the caudal peduncle . . . . . 8. *S. micrurus* p. 229.
  c'. L.l. ± 60; L.tr. 18; Predorsal scales ± 22. Scales of anterior part of body smaller than the scales on the sides and the caudal peduncle . . . . . . 9. *S. ouwensi* p. 231.
B. Upper lip without median cleft, two narrow lateral clefts are present.
  a. Lipmargin of upper lip entire, papillae on gum beneath it small. L.l. ± 66; L.tr. 17; Predorsal scales ± 25. Scales of anterior part of body smaller than on the sides and the caudal peduncle. . . . . 10. *S. longifilis* p. 232.
  b. Lipmargin of upper lip denticulate-crenate, no papillae on the gum beneath it. L.l. ± 62; L.tr. ± 16; Predorsal scales ± 16. Scales of anterior part of body smaller than on the sides and the caudal peduncle . . . . 11. *S. brevis* p. 233.
Doubtful species . . . . 12. *S. xanthurus* p. 234.

1. **Sicyopterus hageni** Popta

Sicyopterus hageni Popta, Zool. Meded. Leiden 6, 1921, p. 211.

D. 1 VI; D.2 I. 10; A. I. 10; P. 19; L.l. 66-68; L.tr. 19; Predorsal scales 25.

Upper lip without clefts, but with papillae along its lower margin.

Height 6 in length, $7^1/_2$ in total length. Head a little depressed, $4^1/_2$ in length, $5^3/_4$ in total length. Eye 5 in head, interorbital 2 eye-diameters. Snout prominent. Jaws subequal. Maxillary extends to below anterior margin of eye. Teeth in lower jaw one large canine on each side of symphysis, followed by 7 smaller conical teeth. First dorsal fin much higher than body, second, third and fourth rays are the longest. Height of second dorsal fin is $1^1/_2$ times the height of body, pointed posteriorly. In female the height of second dorsal fin is equal to depth of body. Anal fin as high as body, pointed posteriorly. Pectoral fin a little longer than head, in female as long as head. Caudal fin rounded, $1^1/_4$ times length of head, in female as long as head. Scales of head, nape, anterior part of body and belly very small and cycloid; other scales ctenoid. Colour in spirits brown, lower part of head yellowish. In male upper lip and median part of throat dusky, in female throat yellowish, an indistinct dark stripe from eye to maxillary. Belly yellowish. First dorsal fin yellowish, anterior part with brown, a brown stripe near base and brown spots on hinder part of fin. Second dorsal fin yellowish with brown spots, which are partly arranged into stripes. Anal fin yellowish with brown, in female with many minute spots. Anal fin bordered with brown. Pectoral fin brown, bordered by a white band along its upper and lower margin. Caudal fin yellowish with a dark submarginal band along upper and lower side, the upper and lower margin are light. Length 91 mm.

Habitat: Lombok (Sapit); Sumbawa (Brang nee river); Wetar (near Ilmedo!); Timor (Baaguia!). — In freshwater.

Types seen in the Leiden Museum.

2. **Sicyopterus microcephalus** (Blkr.)

Sicydium microcephalus Bleeker, Nat. Tijdschr. Ned. Indië 7, 1854, p. 437.
Sicydium microcephalum Günther, Cat. Fishes 3, 1861, p. 95.
Sicyopterus microcephalus Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 278.
Sicydium microcephalum Grant, Proc. Zool. Soc. London 1884, p. 169.
Sicyopterus microcephalus M. Weber, Siboga Exp. Fische 1913, p. 456.
Sicyopterus garra Hora, Rec. Indian Mus. 27 pt. 2, 1925, p. 35, pl. 2 figs. 2-5.
Sicyopterus garra Herre, o.c. 41, 1939, p. 348.
Sicyopterus microcephalus Koumans, Rec. Indian Mus. 42, 1940, p. 17. — Mem. Indian Mus. 13, 1941, p. 295.

D. 1 VI; D. 2 I. 10; A. I. 10; P. 19-20; L.l. 60-70; L.tr. 15-16; Predorsal scales 20.

Upper lip without clefts, but with papillae along its lower margin.

Body anteriorly cylindrical, posteriorly compressed, height $5^1/_2$ in length, $7\text{-}7^3/_4$ in total length. Head subcylindrical, $4^3/_4\text{-}5^1/_4$ in length, $6^2/_3\text{-}6^3/_4$ in total length, in young specimens comparatively larger. Eye 4 to more that 4 in head, interorbital 2 eyediameters. Snout obtuse, prominent. Jaws subequal. Maxillary extends to below anterior part of eye. In lower jaw on each side 5-8 canines. Scales of occiput, nape and belly cycloid. Scales of head and nape small, laterally anteriorly on body smaller than those of middle of body. First dorsal fin pointed, higher than body, second, third and fourth rays are the longest. Second dorsal fin lower than body, pointed posteriorly. Anal fin a little higher. Pectoral fin rounded, longer than head. Ventral fin a little shorter than head without snout. Caudal fin obtuse, longer than head. Colour violet above, pearl coloured below. Below eye a violet streak. On the sides yellow spots in longitudinal rows, on caudal peduncle spots form stripes. Fins reddish violet. Pectoral fin with many spots. Dorsal fins with minute irregular spots. Caudal fin with longitudinal deep violet streaks, above and below the fin is bordered with orange. Pectoral and ventral fin bordered with orange. Anal fin violet-orange, dusky bordered. Length 112 mm.

Nom. indig.: Sèrèg (Tjikadjang, Java).

Habitat: Java (Tjibiliong, Tjikaegan!); Flores (Wai Ratjang or Wako!); Sumba (Mas Marru!); Timor (Baaguia!, Amarassi!, Putain!); Celebes (?Sawangan, Kwandang!). — Andamans!. — In rivers.

Specimens of Bleeker's collection seen in the Leiden Museum, type of *Sicyopterus garra* seen in the Indian Museum, Calcutta.

3. **Sicyopterus gymnauchen** (Blkr.) (Fig. 52, p. 220)

Sicydium gymnauchen Bleeker, Act. Soc. Indo Neerl. 3, 1858, p. 11.
Sicydium gymnauchen Günther, Cat. Fishes 3, 1861, p. 95.
Microsicydium gymnauchen Bleeker, Versl. Ak. Amsterdam (2), 9, 1876, p. 284.
Sicydium gymnauchen Grant, Proc. Zool. Soc. London 1884, p. 163.
Sicyopterus tauae Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 410, fig. 96.
Microsicydium gymnauchen M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 46, fig. 11.
Microsicydium gymnauchen De Beaufort, Bijdragen Dierkunde 1913, p. 143.
Sicyopterus gymnauchen Koumans, Zool. Meded. Leiden 12, 1929, p. 1. — Mem. Indian Mus. 13, 1941, p. 294.
Bryanina inana Fowler, Occ. Pap. B.P. Bishop Mus. 9 no. 25, 1932, p. 10, fig. 5.
Sicyopterus tauae Koumans, Zool. Meded. Leiden 22, 1940, p. 126 (as synonym).
Bryanina inana Koumans, o.c. p. 157 (as synonym).

D. 1 VI; D. 2 I. 9-10; A. I. 10; P. ± 10; L.l. 52-55 (12-15 cycl. and ± 40 ct); L.tr. 14-15; Predorsal scales 11-12.

Upper lip entire, without clefts, without papillae.

Body anteriorly cylindrical, posteriorly compressed, height 6-7 in length, 7-8 in total length. Head obtuse, cylindrical, $4^1/_2$ in length, $5^1/_2$ in total length. Eye 4-$4^1/_2$ in head, interorbital 1 eyediameter. Snout prominent. Jaws subequal. Maxillary extends to below anterior part of eye. Scales deciduous cycloid on anterior part of body, ctenoid on posterior part. Scales of anterior part about equal to those of middle of body. First dorsal fin a little lower than body, second and third rays are the longest. Pectoral fin a little shorter than head. Ventral fin a little longer than postorbital part of head. Caudal fin slightly emarginate, about as long as head. Colour green above, pearllike below. Body with blackish transverse stripes, narrower than the interspaces, the first through eye, second from nape to breast, the eighth on base of caudal fin. The 4-5 posterior stripes are a little narrower than the other stripes and a little obliquely placed. The stripes on body may be diffuse or totally wanting. Fins reddish. Anal fin with blackish spots. Length 37 mm.

Nom. indig.: Impun (Mal.), Nikat (Menado).

Habitat: Java (small rivers to Southcoast!, Patjitan!); Timor (Kupang!); Celebes (Menado!, Gorontalo!); Ceram (river Eme!); Ambon (Seri!); Great Kei (river near Erlalaan!). — Ceylon!, Samoa Islands (Apia!), Society Islands (Tahiti!); Marquesas Islands. — In estuaries.

Types of *Sicydium gymnauchen* seen in the Leiden Museum, type of *Sicyopterus tauae* seen in U.S. Nat. Museum, type of *Bryanina inana* seen in B.P. Bishop Museum.

Note: *Sicyopterus gymnauchen* is of value, as it is used for food by the natives. Especially at the South coast of Java there is a fishery on "impun", which consists nearly totally of *S. gymnauchen,* swimming up the small rivers at certain times. Probably it is the postlarval form of several species of *Sicyopterus,* which are in this stage hardly to be distinguished. The characters of scales and clefts in the upper lip develop when the specimens of the different species of *Sicyopterus* are longer than 36 mm, so that it is till now not possible to determine the young specimens of a length, lower than 40 mm. Only the study of a large material may dissolve this problem.

4. **Sicyopterus wichmanni** (M. Weber)

Sicydium Wichmanni M. Weber, Zool. Ergebnisse 3, 1894, p. 413 (pro parte).

D. 1. VI; D. 2 I. 10-11; A. I. 10; P. 19; L.l. 65; L.tr. 17; Predorsal scales ± 24.

Upper lip entire without clefts, lip margin denticulate-crenate, no papillae on gum beneath it.

Height of body 5-$6^1/_4$ in length, $6^1/_2$-8 in total length. Head a little depressed, 4-5 in length, 5-$6^1/_4$ in total length. Eye 5-6 in head, interorbital $1^1/_2$-2 eyediameters. Snout 1-2 eyediameters. Maxillary extends to below anterior margin of eye. Scales of head, nape, belly and anterior part of body cycloid are smaller than the ctenoid scales on the sides and caudal peduncle. Middle rays of first dorsal fin prolonged. Second dorsal fin about as high as body. Pectoral fin a little shorter than head. Caudal fin rounded, $1^1/_4$ times length of head. Colour reddish brown, on back darker, where sometimes dark blotches are found. A dark stripe from eye to maxillary. Fins light. Dorsal fins with elongate brown spots. Length 65 mm.

Habitat: Flores (Endeh in river Dona and Ba!, river near Reo!); Timor (river near Kupang!).

Note: This species is allied to *S. panayensis* Herre, but does not show a distinct lateral cleft in upper lip. In its measurements it shows some differences. Two specimens, mentioned by M. Weber from river Dona and Ba, belong to *S. ouwensi* M. Weber. The specimen from river near Kupang, Wichmann leg. Febr. 1889, in the collection of the Amsterdam Museum is taken as lectotype.

5. **Sicyopterus cynocephalus** (C.V.)

Sicydium setiger v. Hasselt in Leiden Museum (pro parte).
Sicydium cynocephalum Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 177.
Gobius Hasseltii Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, p. 250.
Sicyopterus cynocephalus Bleeker. Versl. Ak. Amsterdam (2), 9, 1876, p. 275.
Sicydium cynocephalum Grant, Proc. Zool. Soc. London 1884, p. 166.
Sicyopterus cynocephalus M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 45.
Sicyopterus cynocephalus M. Weber & De Beaufort, Versl. Gewone Verg. Wis- en Natuurk. Afd. Kon. Ak. Wet. Amsterdam 1912, p. 137.
Sicyopterus cynocephalus M. Weber, Bijdragen Dierkunde 1913, p. 213.
Sicyopterus cynocephalus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 306.
Sicyopterus crassus Herre, o.c. p. 307, fig. 2, pl. 24 fig. 2.

Sicyopterus fuliag Herre, o.c. p. 309, fig. 3.
Sicyopterus crassus Koumans, Zool. Meded. Leiden 22, 1940, p. 193(as synonym).
Sicyopterus fuliag Koumans, o.c. p. 193 (as synonym).

D. 1 VI; D. 2 I. 11; A. I. 10; P. 21-23; L.l. 75-80; L.tr. 17; Predorsal scales 35.

Upper lip with a median cleft and 2 alveolus like lateral clefts, inner margin of upper lip with papillae.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $5^1/_2$-6 in length, 6-$7^1/_2$ in total length. Head obtuse, subcylindrical, $4^3/_4$ in length, $5^1/_2$-$6^1/_4$ in total length. Eye 4-5 in head. Interorbital $1^1/_3$-2 eyediameters. Snout obtuse, convex, prominent. Jaws subequal. Maxillary extends to below posterior part of eye. Teeth in upper jaw bent halfway, in lower jaw on each side 5-12 caninoid teeth. Scales of head, nape, scapula and belly cycloid, other scales ctenoid. Scales on anterior part of body much smaller than those of middle of body. First dorsal fin pointed, higher than body, third ray is prolonged. Second dorsal and anal fin lower than body, posteriorly pointed. Pectoral fin obtuse, a little longer than head. Ventral fin a little longer than postorbital part of head. Caudal fin obtuse, a little longer than head. Colour deep violet to olivous above, orange below. Below eye a subvertical violet streak. Back with 6-7 violet oblique bands, sometimes indistinct. Dorsal and anal fin orange. Second dorsal fin sometimes with irregular dark spots. Anal fin violet on basal part. Pectoral fin violet-olivous, posteriorly violet, above and below a violet streak near margin. Length 165 mm.

Nom. indig.: Utjang (Jav.), Mènga (Tjikadjang), Mukus (Sum.), Ikan bungkus (Menang Kabou).

Habitat: Sumatra (Padang, Priaman, Padang Pandjang!, Tapan river near Muara Sako!); Java (Tjisekat, Krawang!, Garut, Purworedjo, Tjikaengan near Tjikadjang!, Tjiwulon near Tasikmalaja!, Sapuran near Wonosobo!, Palabuan, Kali Mandiku!); Madura (Branta!); Bali (Boleleng); Lombok (Sapit!); Adonare (Wuri); Timor (Baaguia!, Fatu Menassi!, Noil Enfut!, Noil Besi!); Wetter (Meta Sau!, river near Ilmedo!); Borneo!; Celebes (Moros, Tonsea, Menado!, Sawangan, Klabatdiatas, river near Balangnipa!, river Malei!); Buton!; Sula Archipelago!; Taliabu (Wai Meha!); Batjan (Labuha); Buru (Wai Nama!); Haruku (Wae

Memi!); Kei Islands!; New Guinea (Wedau river). — Philippines!. — In rivers.

Types of *Sicydium cynocephalum* seen in Paris Museum, types of *Sicyopterus crassus,* and type and cotypes of *S. fuliag* seen in Bureau of Science, Manila.

6. **Sicyopterus parvei** (Blkr.)

Sicydium Parvei Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 426.
Sicydium parvei Günther, Cat. Fishes 3, 1861, p. 94.
Sicyopterus parvei Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 277.
Sicydium parvei Grant, Proc. Zool. Soc. London 1884, p. 167.

D. 1 VI; D. 2 I. 10; A. I. 10; P. 21; L.l. 70; L.tr. 17-18; Predorsal scales 30.

Upper lip with median cleft and 2 lateral narrow clefts, inner margin of upper lip with papillae.

Body anteriorly cylindrical, posteriorly compressed, height 6 in length, 7 in total length. Head subcylindrical. $4^1/_2$ in length, $5^1/_2$-$5^3/_4$ in total length. Eye 4-5 in head, interorbital $1^1/_2$-2 eyediameters. Snout obtuse, prominent. Jaws subequal. Maxillary extends to middle of eye. In lower jaw on each side 8 canines. Scales of nape, scapula and belly cycloid, other scales ctenoid. Scales on head to frontmargin of preopercle. Scales anteriorly on body smaller than those on the middle of body. First dorsal fin pointed, higher than body, third ray is the longest. Second dorsal and anal fin lower than body, pointed posteriorly. Pectoral fin obtuse, longer than head. Ventral fin about as long as head without snout. Caudal fin obtusely rounded, a little longer than head. Colour blackish violet, lighter below. Fins dusky violet. Caudal fin orange, broadly bordered above and below with violet. Length 119 mm.

Habitat: Java (Garut!, Palabuan). — In rivers.

Types seen in the Leiden Museum.

7. **Sicyopterus macrostetholepis** (Blkr.)

Sicydium setiger v. Hasselt in Leiden Museum (pro parte).
Sicydium macrostetholepis Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 271.
Sicyopterus macrostetholepis Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 281.
Sicydium macrostetholepis Grant, Proc. Zool. Soc. London 1884, p. 168.

D. 1 VI; D. 2 I. 11; A. I. 10; P. 19; L.l. 50; L.tr. 14-15; Predorsal scales 18.

Upper lip with a median cleft and 2 alveolus like lateral clefts, inner margin of upper lip with papillae.

Body cylindrical anteriorly, compressed posteriorly, height $5^1/_2$ in length, $6^1/_2$-7 in total length. Head obtuse, subcylindrical, $4^3/_4$ in length, $5^1/_3$-$5^1/_2$ in total length. Eye $4^1/_2$-5 in head, interorbital $1^2/_3$ eyediameter. Snout obtuse, prominent. Jaws subequal. Maxillary extends to below posterior part of eye. In lower jaw on each side 5-6 canines. Scales of nape, scapula and belly cycloid, other scales ctenoid. Scales on head and nape small. Scales anteriorly on body larger than those of the middle of body. Scales on head to halfway eye and posterior margin of preopercle. First dorsal fin pointed, higher than body, second, third and fourth rays are the longest, prolonged. Second dorsal and anal fin a little lower than body, pointed posteriorly. Pectoral fin obtuse, about as long as head. Ventral fin about as long as postorbital part of head. Caudal fin obtuse, a little longer than head. Colour violet to blackish-violet above, lighter below. Back with 5-6 broad diffuse blackish-violet transverse bands. Dorsal fins and caudal fin dusky violet with minute blackish spots. Pectoral fin violet green, bordered by orange. Ventral fin greenish orange. Anal fin dusky to violet, margin black. Caudal fin with a median longitudinal dusky to black streak, which forms near the margin a horseshoe-shaped band. Length 103 mm.

Habitat: Singapore; Pulu Weh (Sabang!); Sumatra (?Priaman, Kaju tanam!); Java!; Bali (Boleleng); Flores (Maumèré river!); Timor (Baaguia!); Ambon. — In rivers.

Specimen of Bleeker's collection seen in the Leiden Museum.

8. **Sicyopterus micrurus** (Blkr.)

Sicydium micrurus Bleeker, Nat. Tijdschr. Ned Indië 5, 1853, p. 341.
Sicydium micrurum Günther, Cat. Fishes 3, 1861, p. 93.
Sicydium macrostetholepis Günther, o.c. p. 94 (not of Blkr.).
Sicyopterus micrurus Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 280.
Sicydium taeniurum Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 183, pl. 112 fig. C.
Sicydium taeniurum Grant, Proc. Zool. Soc. London 1884, p. 161.
Sicydium micrurum Grant, o.c. p. 164.
Sicydium taeniurum Perugia, Ann. Mus. Civ. Genova 27 (2a ser. 7) 1889, p. 274.

Sicyopterus micrurus M. Weber, Siboga Exp. Fische 1913, p. 456.
Sicyopterus micrurus M. Weber & De Beaufort in Sarasin & Roux, Nova Caledonia Zool. 2 Livr. 1 no. 2, 1915, p. 40.
Sicyopterus micrurus M. Weber & De Beaufort in Kleiweg de Zwaan, Die Insel Nias bei Sumartra 1915, p. 274.
Sicyopterus taeniurus M. Weber & De Beaufort, o.c. p. 274.
Sicyopterus extraneus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 311, fig. 4.
Sicyopterus micrurus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 400.
Sicyopterus taeniurus Fowler, o.c. p. 401.
Sicyopterus extraneus Koumans, Zool. Meded. Leiden 22, 1940, p. 193 (as synonym).

D. 1 VI; D. 2 I. 10; A. I. 10-11; P. 18-19; L.l. 55-60; L.tr. 15-16; Predorsal scales 24 (± 18 large and ± 6 small ones).

Upper lip with a median cleft and 2 alveolus like lateral clefts, opposite the eyes, inner margin of upper lip with papillae.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5 in length, more than 6 in total length. Head obtuse, subcylindrical, 5 in length. Eye 4 in head. Interorbital 2 eyediameters. Snout obtuse, prominent. Jaws subequal. Maxillary extends to below middle of eye. In lower jaw on each side 5-6 canines. Scales of head, nape and belly cycloid, other scales ctenoid. Scales anteriorly on body larger than those of middle of body. Scales of nape and head small. First dorsal fin pointed, about as high as body, third ray is the longest. Second dorsal and anal fin lower than body. Pectoral fin obtuse, a little shorter than head, or as long as head. Ventral fin a little shorter than head without snout. Caudal fin obtuse, about as long as head. Colour olivous-green above, yellowish on the sides, pearl like below. Back and sides with about 8 blackish-violet transverse bands. Dorsal fins olivous-orange. Pectoral and ventral fin orange. Anal fin orange, violet towards margin, lower margin red to yellow. Caudal fin for the most part orange with a broad horseshoe shaped band and a median longitudinal band of blackish-violet. Length 95 mm.

Habitat: Nias (Lolowua!, Lolowau!, Lelemboli); Java (Nusa Kembangan!); Bali (Boleleng); Wetter (river near Ilmedo!); Babber (Jer Lawi!, Jer Toilela!); Taliabu (Wai Meha!); Salibabu (Lirung); Ambon. — Philippines!, Melanesia, Polynesia, Society Islands (Tahiti), Fiji Islands, Samoa Islands. — In rivers.

Specimens of Bleeker's collection seen in the Leiden Museum, type and cotypes of *Sicyopterus extraneus* seen in Bureau of Science, Manila.

9. **Sicyopterus ouwensi** M. Weber

Sicyopterus Kampeni M. Weber in Amsterdam Museum.
Sicydium Wichmanni M. Weber, Zool. Ergebnisse 3, 1894, p. 413 (pro parte).
Sicyopterus Ouwensi M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 602.
Sicyopterus zurstrasseni Popta, Zool. Meded. Leiden 6, 1921, p. 213.
Sicyopterus ouwensi Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 400.
Sicyopterus marquesensis Fowler, Occ. Pap. B.P. Bishop Mus. 9 no. 25, 1932, p. 7, fig. 3.
Sicyopterus marquesensis Koumans, Zool. Meded. Leiden 22, 1940, p. 157 (as synonym).

D. 1 VI; D. 2 I. 10-11; A. I. 10; P. 21; L.l. ± 60; L.tr. 18; Predorsal scales ± 22.

Upper lip with a median cleft and 2 alveolus like lateral clefts, inner margin of upper lip with papillae.

Body anteriorly cylindrical, posteriorly compressed, height $4^1/_2$-$5^1/_4$ in length, $5^8/_9$-$6^1/_2$ in total length. Head subcylindrical, 4 in length, $5^3/_5$ in total length. Eye 5 in head, interorbital 2 eyediameters. Snout prominent. Jaws subequal. Maxillary extends to below middle of eye. Teeth in lower jaw conical. Scales of head, nape and anterior part of body small, cycloid. Scales on head to a little behind the eyes. First dorsal fin a little higher than body, middle rays are the longest, prolonged. Second dorsal and anal fin a little lower. Pectoral fin as long as head. Caudal fin rounded, a little longer than head. Colour in spirits brownish yellow. Upper part and sides of head spotted with brown, lower part of head brownish yellow. A transversal dark streak from eye to end of maxillary. Laterally on body and tail 7 oblique transverse bands, broader than the interspaces. Lower part of body and ventral fin brownish yellow. Dorsal fins and anal fin brown, anal fin with a dark margin. Caudal fin brownish yellow with a brown submarginal stripe along upper and lower margin and two longitudinal stripes in the middle. Pectoral fin brown, bordered by brownish yellow, sometimes with 2 dark longitudinal stripes. Length 131 mm.

Habitat: Sumba (Melolo river!); Flores (river Donda and Ba near Endeh!, river Maumèré near Kotting!); Wetter; New Guinea (Mbai river!, river near Humboldt bay!). — Marquesas Islands!. — In freshwater.

Types of *Sicyopterus ouwensi* seen in the Amsterdam Museum, type of *S. marquesensis* seen in B.P. Bishop Museum.

Note: Two of the specimens mentioned by M. Weber, Zool. Ergebnisse 3, 1894, p. 413, as *Sicydium Wichmanni* from river Donda and Ba, Flores, belong to this species.

10. **Sicyopterus longifilis** Bfrt. (Fig. 53, p. 232)

Sicyopterus longifilis De Beaufort, Zool. Anzeiger 39, 1912, p. 140.
Sicyopterus cynocephalus M. Weber & De Beaufort, Versl. Gewone Verg. Wis- en Natuurk. Afd. Kon. Ak. Amsterdam 1912, p. 133 (not of C.V.).
Sicyopterus longifilis De Beaufort, Bijdragen Dierkunde 1913, p. 146, fig. 8.
Sicyopterus lacrymosus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 303, fig. 1, pl 24 fig. 1 (pro parte).
Sicyopterus lacrymosus Koumans, Zool. Meded. Leiden 22, 1940, p. 193 (as synonym).

D. 1 VI; D. 2 I. 10; A. I. 10; P. 19; L.l. ± 66; L.tr. 17; Predorsal scales ± 25.

Upper lip without median cleft, 2 narrow lateral clefts, papillae on gum beneath it small.

Height of body 5-5$^1/_2$ in length, 6-7 in total length. Head 3$^3/_4$-4 in length, 4$^3/_5$-5 in total length. Eye 5-6 in head, interorbital 2 eyediameters. Snout 2 times the eye. Jaws subequal. Maxillary extends to below frontmargin of eye. Teeth in upper jaw tricuspid, in lower jaw 8 strong teeth on each side, 1 canine on each side of symphysis. Head scaled above the eye, rest naked. Scales of head, nape and belly cycloid, other scales ctenoid. Scales of predorsal region and anteriorly on body smaller than those of middle of body. Dorsal fins close together. Second to fifth rays of first dorsal

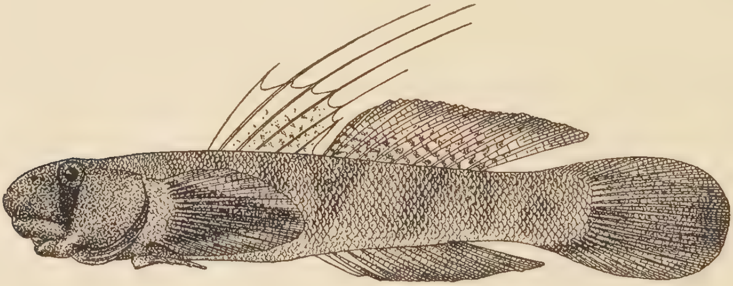

Fig. 53. *Sicyopterus longifilis* Bfrt. After de Beaufort.

fin filiform, very long, longer than half the length of body. Second dorsal fin higher than body, pointed posteriorly. Anal fin lower than body. Caudal fin rounded, a little longer than head. Pectoral fin pointed, as long as head. Ventral fin half the length of pectoral fin. Colour in spirits brownish, lighter on belly and lower side of head. Chin blackish. Seven to eight indistinct dark transverse bands on back. A black stripe from eye to corner of mouth. First dorsal fin whitish with an indistinct dusky spot between third and fifth ray. Hinderpart of first dorsal fin and the whole second dorsal fin with dark spots. Caudal fin blackish, upper and lower margin bordered with white. Pectoral fin blackish with broad white margin, narrowing to the tip. Ventral fin white. Length 97 mm.

Nom. indig.: Ikan Wahat (Wahai).

Habitat: Babber (Jer Lawi!); Ceram (upper course of river Tubah!, Rana Wahai!). — Philippines!. — In freshwater.

Types of *Sicyopterus longifilis* seen in the Amsterdam Museum, type of *S. lacrymosus* seen in Bureau of Science, Manila.

11. **Sicyopterus brevis** Bfrt.

Sicyopterus brevis De Beaufort, Zool. Anzeiger 39, 1912, p. 141. — Bijdragen Dierkunde 1913, p. 147.
Sicyopterus brevis Koumans, Zool. Meded. Leiden 13, 1930, p. 5.

D. 1 VI; D. 2 I. 10; A. I. 10-11; P. 19; L.l. ± 62; L.tr. ± 16; Predorsal scales ± 16.

Upper lip without median cleft, 2 narrow lateral clefts, lipmargin of upper lip denticulate-crenate, no papillae on gum beneath it.

Body anteriorly cylindrical, posteriorly compressed, height $4^3/_5$ in length, $5^1/_2$ in total length. Head $3^3/_4$ in length, $4^3/_5$ in total length. Eye 4 in head, interorbital $1^1/_2$ eyediameter. Snout obtuse, prominent. Jaws subequal. Maxillary extends to below anterior part of eye. Scales on occiput, nape and belly cycloid. Scales of head and nape and anterior part of body smaller than those on middle of body. First dorsal fin as high as body, third ray is the longest. Second dorsal and anal fin lower than body. Pectoral fin shorter than head. Ventral fin half the length of head. Caudal fin obtuse, $5^1/_4$ in length, $6^1/_2$ in total length. Colour in spirits yellowish. Below eye a dark stripe to corner of mouth. A dark longitudinal band along the sides, another interrupted zic-zac shaped one, less distinct, at each side of back. An indistinct dusky spot between third and fourth ray of first dorsal fin. Second dorsal fin obliquely striped with blackish. Anal fin with dark submarginal band. Caudal fin with indistinct median stripe and traces of a horseshoe-shaped submarginal band. Length 45 mm.

Habitat: Ceram (river Tubah!); Ambon Hitu (Ajer Larike!). — In rivers.

Types seen in the Amsterdam Museum.

Note: The species is very close to *Sicyopterus panayensis* Herre, but differs in the number of scales and in the colour.

12. **Sicyopterus xanthurus** (Blkr.)

Sicydium xanthurus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 271.
Sicydium xanthurum Günther, Cat. Fishes 3, 1861, p. 93.
Sicyopterus (Sicydiops) xanthurus Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 314.
Sicydiops xanthurus Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 283.
Sicydium xanthurum Grant, Proc. Zool. Soc. London 1884, p. 162.

D. 1 VI; D. 2 I. 11; A. I. 10; P. 19-20; L.l. 50; L.tr. 12; Predorsal scales 14.

Upper lip?.

Body anteriorly cylindrical, posteriorly compressed, height 8 in total length. Head subcylindrical, 6 in total length. Eye $3^1/_2$ in head, interorbital 1 eyediameter. Snout prominent. Jaws subequal. Maxillary extends to below middle of eye. In lower jaw on each side 5-6 canines. Scales of nape, anterior part of body and belly cycloid, other scales ctenoid. Scales of anterior part of body not larger than those on the middle of body. First dorsal fin pointed, higher than body, third ray is the longest. Second dorsal and anal fin a little lower than body, pointed posteriorly. Pectoral fin obtuse, a little longer than head. Ventral fin a little longer than postorbital part of head. Caudal fin obtuse, a little longer than head. Colour blackish violet, lighter below. Caudal peduncle posteriorly orange. Dorsal fins and anal fin dusky violet. Pectoral fin greenish violet, bordered by orange. Ventral fin feebly violet. Caudal fin orange with a black horsehoe-shaped band. Length 64 mm.

Habitat: Sumatra (Priaman?); Bali (Boleleng). — In rivers.

Not seen by us. The type is evidently lost, the description is made after Bleeker. The position of the species among the other species of *Sicyopterus* is not clear, as the shape of upper lip is not known.

2. **Stiphodon** M. Weber

(M. Weber in Semon, Zool. Forschungsreisen 5, 1895, p. 269)

?*Vailima* Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 398.
Microsicydium Jordan & Seale, o.c. p. 411 (not of Blkr.).
Microsicydium Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 295 (not of Blkr.).

Body elongate, subcylindrical, covered with about 35 ctenoid scales, which are a little smaller on the anterior part of body. Head flattened above. Head and foremost part of the body naked to scaled with cycloid scales. Cleft of mouth small, nearly horizontal, upper jaw prominent. Snout obtuse, rounded, prominent. Lips scarcely thickened. Lower lip with a series of numerous very small horizontal teeth. In upper jaw a row of numerous, closely set teeth, which are more or less tricuspid; beside these, the upper jaw has some movable microscopic teeth, which are hooked bent. Lower jaw with a few canine like teeth, bent outwards and backwards. No barbels. Dorsal fins separate. First dorsal fin with 6 rays. Ventral fins form a sucking disk, which is only at its base attached to the belly, the rays are normally ramificated.

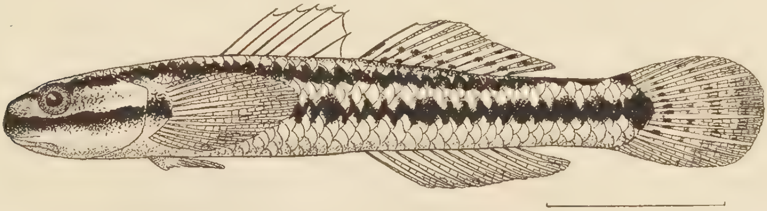

Fig. 54. *Stiphodon elegans* (Steind.). × 2½.

Distribution: Indo-Australian Archipelago, Philippines to the Pacific.

1. **Stiphodon elegans** (Steind.) (Fig. 54, p. 235)

Sicydium elegans Steindachner, Sitz. ber. Ak. Wiss. Wien 1879, p. 152.
Sicydium elegans Grant, Proc. Zool. Soc. London 1884, p. 162.
Gobius (baliuroides Blkr.?) M. Weber, Zool. Ergebnisse 3, 1894, p. 413 (not of Blkr.).

Stiphoden semoni M. Weber in Semon, Zool. Forschungsreisen 5, 1895, p. 270, fig. 1.
?*Vailima stevensoni* Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 398, fig. 87.
Microsicydium elegans Jordan & Seale, o.c. p. 411.
Stiphodon semoni M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 264.
Stiphodon elegans De Beaufort, Bijdragen Dierkunde 1913, p. 143, pl. 2 figs. 4, 5.
Stiphodon elegans M. Weber & De Beaufort, Zool. Meded. Leiden 6, 1921, p. 72.
Microsicydium elegans, Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 401.
?*Vailima stevensoni* Fowler, o.c. p. 411.
Stiphodon elegans Fowler, Occ. Pap. B.P. Bishop Mus. 9 no. 25, 1932, p. 8, fig. 4.
Stiphodon elegans Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 387, fig. 34.
Stiphodon pelewensis Herre, Philipp. Journ. Sci. 59 no. 2, 1936, p. 282.
Stiphodon elegans Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 138, fig. 7.
?*Vailima stevensoni* Koumans, Zool. Meded. Leiden 22, 1940, p. 125 (as probable synonym).
Stiphodon pelewensis Koumans, o.c. p. 151 (as synonym).
Stiphodon elegans Schultz, Bull. 180 U.S. Nat. Mus., 1943, p. 231.

D. 1 VI; D. 2 I. 9; A. I. 10; L.l. 33-35; L.tr. 8-9; (Predorsal scales ± 14).

Body elongate, a little compressed, height $5^1/_3$-7 in length. Head about $4^1/_2$-5 in length. Eye 3-4 in head. Snout prominent, about as long as eye. Mouth about horizontal. Teeth in lower jaw on each side 3-4 curved canines. Lower lip with a row of small teeth. In upper jaw a row closely set teeth, which are more or less tricuspid, and some movable microscopic hooked bent teeth. Head naked to scaled above behind eye with deciduous cycloid scales. Rays of first dorsal fin prolonged in male. Colour of female yellowish with two longitudinal black stripes, one from eye over pectoral fin to behind second dorsal fin, the other from snout, crossing opercle, to caudal fin. A pair of black lines from upper half of eye to first dorsal fin, making some spots to second dorsal fin. Colour of male is a darkbrown body with two yellowish transverse bands, one before and one behind second dorsal fin. Vertical fins dark. Margin of anal fin light. Caudal fin with light spots. Pectoral fin light with black spots. For life colours see De Beaufort, Bijdragen Dierkunde 1913, p. 144, pl. 2 figs. 4, 5. Length 45 mm.

Nom. indig.: Njårå (Jav.).

Habitat: Sumatra (Labuan Batu!); Nias (Lolowua); Java

(Nusa Kambangan!, Tjilatjap!); Flores (Wai Ratjang or Wako!, river near Ba!, river near Mbawa!); Celebes (river near Palopo!); Batjan!; Ceram (river Eme!, river Riuapa!, river Tubah!); Ambon! (Ajer Larike!); New Guinea (Mamapiri!, Klipong). — Philippines (Camiguin), Pelew Islands!, Sandwich Islands, New Caledonia (river Foa!), Fiji, ?Samoa, Tonga, Society Islands (Tahiti), Marquesas Islands!.

Types of *Stiphodon semoni* seen in the Amsterdam Museum, type of *Vailima stevensoni* seen in U.S. Nat. Museum, type of *Stiphodon pelewensis* seen in Stanford University.

3. **Pleurosicya** M. Weber

(M. Weber, Siboga Exp. Fische 1913, p. 456)

Body elongate, cylindrical, covered with about 25 ctenoid scales. Head pointed, scaled above behind the eyes, rest of head naked? Breast naked. Mouth a little oblique, upper jaw a little prominent. Lower lip with a row of needle-like movable small teeth, obliquely placed. In upper jaw teeth in one row, simple, unequal, partly caninoid. Teeth in lower jaw small, in one row, behind symphysis two curved canines. Isthmus narrow. Dorsal fins separate. First dorsal fin with 6 rays. Ventral fins united, forming a disk, which is not adherent to the belly, with many ramifications of the rays in a short distance.

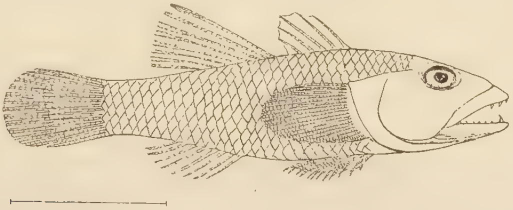

Fig. 55. *Pleurosicya boldinghi* M. Weber × 2.

Distribution: West New Guinea.

1. **Pleurosicya boldinghi** M. Weber (Fig. 55, p. 237)

Pleurosicya Boldinghi M. Weber, Siboga Exp. Fische 1913, p. 457, fig. 88.
Pleurosicya boldinghi Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 402.

D. 1 VI; D. 2 I. 7; A. I. 7; P. 18; L.l. ± 25; L.tr. 9; Predorsal scales ± 10.

Body cylindrical, height $4^1/_2$ in length. Head subcylindrical $3^1/_3$ in length. Eye 4 in head, interorbital $^1/_2$ eyediameter. Snout a little longer than eye. Upper jaw prominent. Maxillary extends to below posterior margin of eye. Teeth in upper jaw in one row, in front caninoid. In lower jaw teeth in one row, behind symphysis two strong canines. Lower lip with a row of needle-like movable small teeth, obliquely placed. Scales of body ctenoid. Head scaled above behind the eyes, cheek and opercle naked. Base of pectoral fin naked. First dorsal fin lower than body, third ray is the longest. Second dorsal fin higher than the first. Pectoral fin rounded. Caudal fin rounded, shorter than head. Colour yellowish with a dark spot on first dorsal fin. Length 31 mm.

Habitat: West New Guinea (1° 42′.5 S, 130° 47′.5 E!) on 32 m depth.

Types seen in the Amsterdam Museum.

4. **Sicyopus** Gill

(Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 262)

Body elongate, covered with 32-55 scales, which are on the most parts of body ctenoid, becoming cycloid on the foremost part of body. Head obtuse, naked. In each jaw a series of slender, hooked, movable teeth; no canines. Labial teeth absent, or deciduous? Lips thick. Cleft of mouth nearly horizontal. Tongue rounded. Second dorsal fin and anal fin obtuse. Isthmus broad. First dorsal fin with 6 rays. D. 2 I. 9-10; A. I. 9-10. Ventral fins united into a short cup-shaped disk, which is not adherent to the belly; the rays are short and with many ramifications on a short distance.

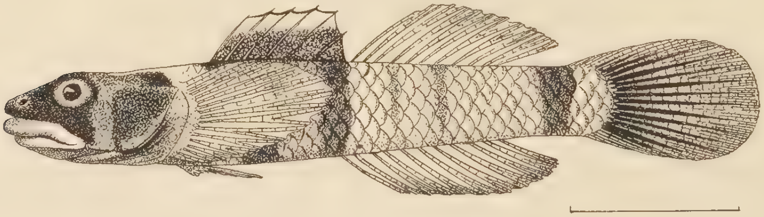

Fig. 56. *Sicyopus zosterophorum* (Blkr.) × $2^1/_3$.

Distribution: Indo-Australian Archipelago, ?Philippines, New Hannover.

Key to the Indo-Australian species of Sicyopus

1 L.l. 32. Body with 4 darker transverse bands. 1. *S. zosterophorum* p. 239.
2. L.l. 35. Body with dark longitudinal band from head to caudal fin. . . . . 2. *S. balinense* p. 240.
3. L.l. ± 55. Body with dark longitudinal band. 3. *S. multisquamatus* p. 241.

1. **Sicyopus zosterophorum** (Blkr.) (Fig. 56, p. 238)

Sicydium zosterophorum Bleeker, Nat. Tijdschr. Ned. Indië 12, 1856-1857, p. 296.

Sicydium zosterophorum Günther, Cat. Fishes 3, 1861, p. 95.

Sicyopus zosterophorum Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 287.

Sicyopus zosterophorum De Beaufort, Bijdragen Dierkunde 1913, p. 145, pl. 2 fig. 3.

Sicyopus zosterophorum M. Weber & De Beaufort in Kleiweg de Zwaan, Die Insel Nias bei Sumatra 1915, p. 274.

?*Sicyopus zosterophorum* Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 139, fig. 8.

Sicyopus zosterophorum Herre, Proc. Biol. Soc. Washington 57, 1944, p. 8.

D. 1 VI; D. 2 I. 9; A. I. 9; P. 15; L.l. 32; L.tr. 8-9; Predorsal scales ± 9.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $5^1/_2$ in length, 8 in total length. Head obtuse, convex, 4 in length, 5 in total length. Eye $3^1/_2$ in head, interorbital 1 eyediameter. Snout obtuse, shorter than eye. Mouth inferior, jaws equal. Maxillary extends to below posterior part of eye. Teeth conical, pointed, curved, distant, on each side 5-6 unequal ones, longer than the following teeth. Upper lip fleshy. Head naked above behind eye, nape with deciduous cycloid scales. Scales of body ctenoid. Scales of caudal region larger than anteriorly. First dorsal fin obtusely rounded, a little lower than body, middle rays are the longest. Second dorsal fin as high as the first, pointed posteriorly. Pectoral fin obtusely rounded, about as long as head. Ventral fin half of head. Anal fin a little lower and shorter than second dorsal fin. Caudal fin rounded, not longer than head. Colour reddish green, lighter below. Head violet. Four dusky-violet transverse bands on body, the first, the broadest, from first ray of first dorsal fin to insertion of second dorsal fin. The second and third below second dorsal fin are naroow, the fourth is broader than the second and third and is situated on the middle of caudal peduncle. Dorsal fins and anal fin with black margin. First dorsal fin dusky-violet, on

upper part yellow orange. Second dorsal fin on basal half violet, on upper half orange yellow. Pectoral, ventral and anal fin orange. Caudal fin on basal half orange, outer half violet-black. Length 51 mm.

Habitat: Nias (Lolowua!); Bali (Boleleng!); Ceram (river Eme!). — Philippines (?Camiguin, Mindanao). — In rivers.

Type seen in the Leiden Museum.

Note: For a description of colours in life and sexual dimorphism see Herre, 1944, p. 9.

2. **Sicyopus balinense** (Blkr.)

Sicydium balinense Bleeker, Nat. Tijdschr. Ned. Indië 12, 1856-1857, p. 297.
Sicydium balinense Günther, Cat. Fishes 3, 1861, p. 96.
Sicyopus balinense Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 288.
Sicyopus balinense M. Weber & De Beaufort in Kleiweg de Zwaan, Die Insel Nias bei Sumatra 1915, p. 274.

D. 1 VI; D. 2 I. 9; A. I. 9; P. 17-18; L.l. 35; L.tr. 8-9; Predorsal scales 7.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $6^1/_2$ in length, 8 in total length. Head 4 in length, more than 5 in total length, a little compressed. Eye $3^1/_2$ in head, interorbital 1 eyediameter. Snout shorter than eye, jaws subequal. Maxillary extends to below middle of eye or to below posterior margin of pupil. Teeth in upper jaw conical, hooked, pointed, on each side about 20. In lower jaw distant, unequal, on each side about 10. In lower lip sometimes teeth are visible. Head and anterior part of nape naked. Scales of body ctenoid. First dorsal fin rounded, much lower than body, middle rays are the longest. Second dorsal and anal fin a little higher than first dorsal fin. Ventral fin half the length of head. Pectoral fin rounded, a little shorter than head. Caudal fin obtusely rounded, about as long as head. Colour reddish green, lighter below. Snout violet. Violet streak from eye to maxillary. Dusky band from head to caudal fin. Back and sides dusky-violet marbled. Many scales of the sides each with a crescent shaped intramarginal stripe. Fins yellowish orange. Pectoral fin with a dusky blotch in middle of base. Caudal fin violet posteriorly. Length 51 mm.

Habitat: Nias (Lolowua!); Bali (Boleleng!). — New Hannover (Namamoso!). — In rivers.

Types seen in the Leiden Museum.

Note: In a specimen of New Hannover of 29 mm total length, the colour in spirits is yellowish, snout violet. Violet streak from tip of snout, below eye to below origin of second dorsal fin; this streak is continued indistinctly to caudal. A second streak from snout through eye, above pectoral fin to below the origin of second dorsal fin, parallel to the first streak. In median of back a third streak. Back with dark spots. Fins yellowish. Rays of second dorsal fin indistinctly spotted. Pectoral fin with dark blotch in middle of the base.

3. **Sicyopus multisquamatus** Bfrt. (Fig. 57, p. 241)

Sicyopus multisquamatus De Beaufort, Zool. Anzeiger 39, 1912, p. 142. — Bijdragen Dierkunde 1913, p. 145, fig. 7.

D. 1 VI; D. 2 I. 10; A. I. 9; L.l. ± 55; L.tr. ± 14.

Body elongate, a little depressed, height almost 7 in length, more than 8 in total length. Head flat above, $3^3/_4$ in length, $4^1/_2$ in total length. Eye 4 in head, interorbital 1 eyediameter. Snout as long as eye. Lips thick. Maxillary extends to below middle of eye. Teeth in upper jaw in one row of about 20, yellow tipped, curved inwards. In lower jaw teeth smaller and not curved. Scales of nape and belly cycloid, posteriorly on body ctenoid. Head naked. First dorsal fin much lower than body, middle rays are the longest. Second dorsal fin a little higher than the first. Ventral fin about half of head. Pectoral fin rounded, shorter than head. Caudal fin truncate. Colour in spirits yellowish. A triangular blackish spot on opercle. Along the side a dark longitudinal band. Rays of dorsal fins dark. Anal fin colourless. Length 58 mm.

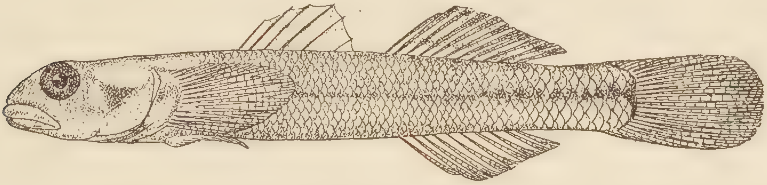

Fig. 57. *Sicyopus multisquamatus* Bfrt. × 1.7.

Habitat: West Ceram (brook near Honitetu!).

Type seen in the Amsterdam Museum.

5. **Gobiopterus** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 311)

Micrapocryptes Hora, Mem. Indian Mus. 5, 1923, p. 751.
Mirogobius Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 91.
Gobiella H. M. Smith, Proc. U.S. Nat. Mus. 79 art. 7, 1931, p. 33.

Body elongate, compressed, covered with 25-36 scales, ctenoid? Head compressed, naked. Cleft of mouth nearly vertical, lower jaw prominent. Teeth in both jaws in one row, in upper jaw caninoid, in lower jaw anterior ones caninoid, lateral ones smaller. In lower jaw behind symphysis on each side a caninus, implanted a little more inwards. No labial teeth. Tongue bilobate. Dorsal fins separate. First dorsal fin with 5-6 rays. D. 2 I. 7-8; A. I. 7-13. Ventral fins united, but free from belly. Caudal fin truncate.

Distribution: India, Singapore, Siam, Philippines, Indo-Australian Archipelago.

Key to the Indo-Australian species of Gobiopterus

1. L.l. 25; L.tr. 8. Upper lip black. Rays of anal fin with blackish spots.	1. *G. brachypterus* p. 242.
2. L.l. 27; L.tr. 7. Tip of lower jaw brown. A series of black spots along back and from origin of anal fin to base of caudal fin.	2. *G. chuno* p. 244.
3. L.l. 36; L.tr. 11.	3. *G. variegatus* p. 244.

1. **Gobiopterus brachypterus** (Blkr.) (Fig. 58, p. 243)

Apocryptes brachypterus Bleeker, Nat. Tijdschr. Ned. Indië 9, 1855, p. 401.
Apocryptes brachypterus Günther, Cat. Fishes 3, 1861, pp. 80, 84.
Gobiopterus brachypterus Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 290.
Mirogobius stellatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 92, pl. 6 fig. 4.
Mirogobius stellatus Koumans, Zool. Meded. Leiden 22, 1940, p. 182 (as synonym).
Gobius spec. Koumans, o.c. p. 172.

D. 1 V; D. 2 I. 7; A. I. (9) 11-12 (13); P. 14-15; L.l. 25; L.tr. 8.

Body elongate, compressed, height 6 in total length. Head depressed, 4 in total length. Eye 4 in head, interorbital 1 eyediameter. Frontal profile straight. Snout depressed, shorter than eye. Mouth very oblique, in male nearly vertical. Lower jaw prominent. Maxillary extends to below anterior part of eye. Teeth large, conical, distant. In upper jaw equal, on each side 9-10. In lower jaw on each side 6-7 erect teeth, anterior 3-4 ones enlarged; on each side of symphysis in lower jaw 2 erected canines. Teeth in female much weaker than in male. Head and neck naked. Dorsal fins separate. First dorsal fin lower than the second. Second dorsal fin convex, not much lower than body. Pectoral fin obtuse, rounded, a little shorter than head without snout. Ventral fin shorter than head without snout. Anal fin much longer than second dorsal fin. Caudal fin obtusely rounded, shorter than head. Colour diaphanous green. Iris yellowish-green: Upper lip black. Fins diaphanous yellow. Rays of anal fin with blackish spots. Length 29 mm.

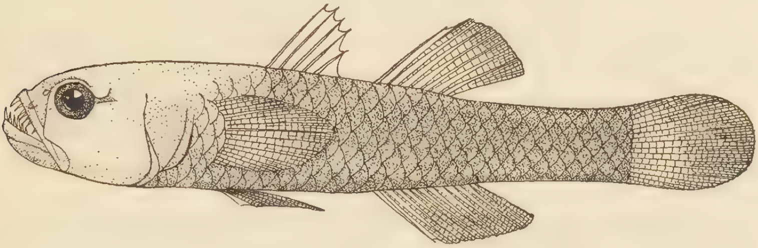

Fig. 58. *Gobiopterus brachypterus* (Blkr.). × 4.

Habitat: Sumatra (Lake Singkarak near Padang!); Java (Lake Grati! = Ranu Klindungan!). — Philippines (Lake Lanigay!), Australia (Melbourne!).

Types of *Apocryptes brachypterus* seen in the Leiden Museum, type of *Mirogobius stellatus* seen in Bureau of Science, Manila.

Note: *Gobiopterus brachypterus* is hardly different from *G. chuno*. The number of divided anal rays mostly is 11-12, but may be 9 and 13, as I found in a few specimens. Six specimens from a river near Moros, Celebes, 5 females and a male, agree with *G. brachypterus,* but the small lateral teeth in upper and lower jaw are developed to the front of the jaw. In this way there are therefore two rows of teeth in front of the jaws.

2. **Gobiopterus chuno** (H. B.)

Gobius chuno Hamilton Buchanan, Gangetic Fishes 1822, p. 53.
Micrapocryptes fragilis Hora, Mem. Indian Mus. 5, 1923, p. 751, figs. 31-33.
Gobius chuno Hora, o.c. 9, 1929, pl. 14 fig. 6 (m.s. drawing of H.B.).
Gobiella pellucida H. M. Smith, Proc. U.S. Nat. Mus. 79 art. 7, 1931, p. 33, fig. 16.
Gobiopterus chuno Hora, Rec. Indian Mus. 36, 1934, p. 487.
Gobiella birtwistlei Herre, Bull. Raffles Mus. 9, 1934, p. 85.
Gobiopterus chuno Mukerji, Rec. Indian Mus. 38, 1936, p. 9-13 (for synonyms).
Gobiella pellucida Koumans, Zool. Meded. Leiden 22, 1940, p. 129 (as synonym).
Gobiella birtwistlei Koumans, o.c. p. 148 (as synonym).
Gobiopterus chuno Koumans, Mem. Indian Mus. 13, 1941, p. 297.

D. 1 V; D. 2 I. 7-8; A. I. 10-11; P. 13-14; L.l. 27; L.tr. 7.

Body elongate, compressed, height $4^1/_2$-5 in length. Head $3^2/_3$-4 in length. Eye $4^1/_2$-5 in head, interorbital 1 eyediameter. Snout a little shorter than eye, tip before upper part of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below anterior margin of pupil. In male teeth in 1 row in upper jaw, conical, distant, caninoid, 9 on each side; in lower jaw in front on each side 4 large conical teeth, laterally a row of smaller ones. On each side behind symphysis a canine. In female and young specimens the teeth are much smaller. Tongue bilobate. Head and nape naked. Scales of body ctenoid. First dorsal fin low, middle rays are the longest. Second dorsal and anal fin in front about as high as body. Caudal fin truncate, as long as head. Pectoral fin as long as head without snout. Ventral fin small. Colour diaphanous with a yellowish tinge. A series of black spots along back and on lower surface from origin of anal fin to base of caudal fin. In spirits the colour is light yellow. Tip of lower jaw brown. Length 27 mm.

Habitat: Singapore!. — India!, Siam!.

Types of *Gobiella pellucida* seen in U.S. Nat. Mus., type and paratypes of *G. birtwistlei* seen in Stanford University, type and cotypes of *Micrapocryptes fragilis* seen in Indian Museum, Calcutta.

3. **Gobiopterus variegatus** (Peters)

Apocryptes variegatus Peters, Monatsber. Ak. Wiss. Berlin (1868) 1869, p. 267.
Gobiopterus variegatus Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 291.

D. 1 VI; D. 2 I. 8; A. I. 7; L.l. 36; L.tr. 11.

Height of body $4^3/_4$ in total length. Head $3^2/_3$ in total length. Eye in second quarter of head, interorbital 1 eyediameter. Teeth in both jaws in a single row, in lower jaw on each side a canine. Colour yellow brown, irregularly spotted with black. A black stripe from eye to upper lip and to upper part of preopercle. On cheek an oblong blotch parallel to the lastnamed stripe. An oblong blotch on middle of base of pectoral fin. Dorsal fin with longitudinal rows of black spots. Caudal fin with transversal rows of black spots. Anal fin with dark longitudinal band. Length?

Habitat: Singapore.

According to Peters, not seen by us.

6. **Leptogobius** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 311)

Body subelongated, covered with about 25 ctenoid scales. Head compressed, naked? Cleft of mouth oblique. Lower jaw prominent. Teeth in each jaw in a row, slender, pointed, equal. No canines, no labial teeth. Tongue bilobate. Second dorsal and anal fin subtriangular, acute. First dorsal fin with 5 rays. D. 2 I. 7; A. I. 12-13. Ventral fins united, but free from belly.

Distribution: Java in lakes.

1. **Leptogobius oxypterus** (Blkr.) (Fig. 59, p. 246)

Gobius oxypterus Bleeker, Nat. Tijdschr. Ned. Indië 9, 1855, p. 400.
Gobius oxypterus Günther, Cat. Fishes 3, 1861, p. 34.
Leptogobius oxypterus Bleeker, Versl. Ak. Amsterdam (2) 9, 1876, p. 292.

D. 1 V; D. 2 I. 7; A. I. 12-13; P. 15; L.l. 25; L.tr. 7-8.

Body elongate, compressed, height 6 in total length. Head pointed, compressed, $4^2/_3$ in total length. Eye 3 in head, interorbital less than 1 eyediameter. Snout pointed, much shorter than eye. Mouth very oblique, lower jaw prominent, maxillary extends to below posterior half of eye. Teeth small, equal. Head and nape naked, scales of body ctenoid. Dorsal fins separate. First dorsal fin much lower than the second. Second dorsal fin pointed posteriorly, a little higher than body. Pectoral fin obtusely rounded, a little longer than head. Ventral fin about half of head. Anal fin longer than second dorsal fin, pointed anteriorly. Caudal fin obtusely rounded, shorter than head. Colour greenish-diaphanous. Fins yellowish-diaphanous. Iris greenish to yellowish. Lips black. Behind anus about 12 hooked transverse streaks. Rays of anal fin with violet spots or stripes. Length 28 mm.

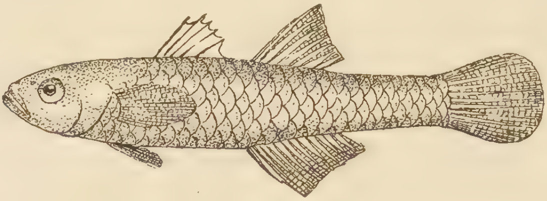

Fig. 59. *Leptogobius oxypterus* (Blkr.) × 3.

Habitat: Java (Lake Grati in prov. Pasuruan!).

Types seen in the Leiden Museum.

5. Subfamily Apocrypteinae

Body very elongate. Head compressed, mostly scaled above and laterally. Teeth in upper jaw in one row, in lower jaw subhorizontal. In lower jaw on each side of symphysis an erected canine. Scales cycloid. Second dorsal fin elongated. Ventral fins totally united, only attached to the belly in their bases. Gillopenings narrow to moderate.

Distribution: Mesopotamia to the Pacific.

Key to the Phalanges of Apocrypteinae

1. Free lower eyelid absent . . . . 1. *Apocryptei* p. 246.
2. Free lower eyelid present . . . . 2. *Boleophthalmi* p. 257.

1. Phalanx Apocryptei

Eyes not or nearly not erected above the dorsal profile of the head, without free lower eyelid. First dorsal fin longer than high.

Key to the Indo-Australian genera of Apocryptei

1. Scales minute, more than 200. Teeth in upper jaw pointed. D. 1 V; D. 2 I. 27-30 . . . . 1. *Pseudapocryptes* p. 247.
2. Scales moderate, less than 150 in longitudinal line.

A. Teeth in lower jaw pointed, anterior teeth in upper jaw caninoid. About 80 scales in L.l. D. 2 I. 19-29 . . . . 2. *Parapocryptes* p. 250.
B. Teeth in lower jaw truncate, obtuse or bilobate.
  a. Anterior teeth of upper jaw strong canines, teeth of lower jaw obtuse, a canine behind symphysis. L.l. 70-90. D. 1. VI; D. 2 I. 24-26 . . . . . . 3. *Apocryptichthys* p. 252.
  b. Anterior teeth of upper jaw caninoid, teeth of lower jaw truncate to bilobate. L.l. 40-60. D. 1 VI; D. 2 I. 22-23 . . . 4. *Apocryptodon* p. 253.

1. **Pseudapocryptes** Bleeker

(Bleeker, Arch. neerl. sc. ex. nat. 9, 1874, p. 328)

Body very elongate, anteriorly subcylindrical, posteriorly compressed, covered with more than 200 very small cycloid scales. Head subcylindrical, totally or nearly totally scaled. Eyes small, bony interorbital and snout about 1 eyediameter. Mouth nearly horizontal, jaws subequal. Teeth in both jaws in one row, pointed, those of lower jaw subhorizontal, on each side of symphsis of lower law a canine. Tongue rounded, nearly totally adnate to the floor of the mouth. Gillopenings not very wide, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins nearly continuous. First dorsal fin with 5 rays.. D. 2 I. 27-30; A. I. 25-29. Ventral fins united, oblong. Pectoral fin without free silklike rays, base scaled. Caudal fin pointed, long.

Distribution: India to Japan, Indo-Australian Archipelago, Tahiti.

Key to the Indo-Australian species of Pseudapocryptes

1. Dorsal fins separate, the membrane of last ray of first dorsal fin ends far before insertion of the second fin. A. I. 25-27. Eye 4-5 in head. . 1. *P. borneensis* p. 247.
2. Dorsal fins nearly continuous, the membrane of last ray of first dorsal fin is scarcely united with the second fin. A. I. 29. Eye 6-7 in head . . . 2. *P. lanceolatus* p. 248.

1. **Pseudapocryptes borneensis** (Blkr.)

Apocryptes borneensis Bleeker, Nat. Tijdschr. Ned. Indië 9, 1855, p. 421.
Apocryptes borneensis Günther, Cat. Fishes 3, 1861, p. 81.

Apocryptes borneensis Vinciguerra, Ann. Mus. Civ. Genova 50 (3a ser. 10). 1926, p. 552.

D. 1 V; D. 2 I. 27-30; A. I. 25-27; P. 21-22.

Body very elongate, anteriorly cylindrical, posteriorly compressed, height 10-12 in total length. Head subcylindrical, $6^1/_3$-$6^3/_4$ in total length. Eye 4-5 in head, with a short tentacle. Snout shorter than eye. Mouth a little oblique, upper jaw prominent. Maxillary extends to below posterior part of eye. Teeth small, in lower jaw subhorizontal. In upper jaw about 19 teeth on each side; in lower jaw about 12 on each side, behind symphysis on each side a canine. Scales on caudal part larger than on the other parts of body. Head scaled with small scales. Dorsal fins separate, the membrane of the last ray of first dorsal fin ends far before insertion of second dorsal fin. Pectoral fin rounded, a little shorter than head. Ventral fin a little shorter than pectoral fin. Caudal fin pointed, much longer than head. Colour above greenish violet, pearl coloured below. Sides dotted with black spots, posteriorly angular transverse bands, with the angle directed frontward. Finmembranes yellowish, rays orange. First dorsal fin anteriorly with small spot, posteriorly with a large grayish-violet spot. Membrane of second dorsal fin with 1-5 blackish spots between each ray. Pectoral fin on basal half with red spots. Caudal fin with spots between the rays. Length 112 mm.

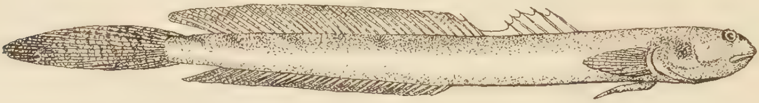

Fig. 60. *Pseudapocryptes lanceolatus* (Bl. Schn.). × $^2/_3$.

Habitat: Borneo (Bandjermasin in river, Sarawak); Timor. — Penang.

After Bleeker, not seen by us, the types are evidently lost.

Note: It is possible that *P. borneensis* is described after young specimens of *P. lanceolatus* (Bl. Schn.).

2. **Pseudapocryptes lanceolatus** (Bl. Schn.) (Fig. 60, p. 248)

Eleotris lanceolata Bloch ed. Schneider, Syst. Ichth. 1801, p. 67, pl. 15.

Gobius changua Hamilton Buchanan, Gangetic Fishes 1822, pp. 41, 365, pl. 5 fig. 10.

Apocryptes changua Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 145.

?*Apocryptes dentatus* Cuvier & Valenciennes, o.c. p. 148.
Apocryptes changua Bleeker, Verh. Bat. Gen. 22, 1849, p. 36.
Apocryptes lanceolatus Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1169.
Apocryptes lanceolatus Günther, Cat. Fishes 3, 1861, p. 80.
?*Apocryptes dentatus* Günther, o.c. p. 81.
Apocryptes lanceolatus Day, Fishes India 1878, p. 301, pl. 64 fig. 5. — Fauna Brit. India Fishes 2, 1889, p. 277.
?*Apocryptes dentatus* Day, Fishes India 1878, p. 301. — Fauna Brit. India Fishes 2, 1889, p. 278.
Apocryptes lanceolatus Hora, Mem. Indian Mus. 5, 1923, p. 751.
Apocryptes lanceolatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 418.
Boleophthalmus taylori Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 159, fig. 128.
Pseudapocryptes lanceolatus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 98.
Aprocryptodon edwardi Fowler, Proc. Ac. Nat. Sci. Philadelphia 89, 1937, p. 257 (substitute name).
Boleophthalmus smithi (misprint for *taylori!)* Koumans, Zool. Meded. Leiden 22, 1940, p. 136 (first sentence from above, as synonym).
Pseudapocryptes lanceolatus Koumans, Mem. Indian Mus. 13, 1941, p. 272.

D. 1 V; D. 2 I. 30; A. I. 29; P. 17-20.

Body very elongate, anteriorly cylindrical, posteriorly compressed, height 7 in length, about 9 in total length. Head subcylindrical, $5^1/_2$ in length, 7-8 in total length. Eye 6-7 in head, interorbital less than 1 eyediameter. Snout about $1^1/_2$ eyediameter. Mouth nearly horizontal. Upper jaw a little prominent. Maxillary extends to below posterior margin of eye. Teeth in each jaw about 24 pointed teeth. In upper jaw in front much larger than laterally. In lower jaw horizontal, pointed; behind symphysis a canine on each side. Dorsal fins much lower than body, membrane of last ray of first dorsal fin scarcely united with the second fin. Caudal fin pointed, much longer than head. Colour brownish gray with brown markings on back and cheek. Belly yellowish. Dorsal fins, pectoral and caudal fin greenish. Rays of second dorsal and caudal fin with brown spots. Ventral and anal fin yellowish. Length 200 mm.

Nom. indig.: Ikan Njanjan (Jav., Surabaja).

Habitat: Singapore; Sumatra (Belawan!, Bagan Si Api Api); Java (Djakarta!, Tandjong Priok!, Anjer, Surabaja!, Kudus!); Madura! (Kammal, Sumanep, Bangkallang); Borneo! (river Banjir, Bandjermasin, Sinkawang, Sarawak!, Balikpapan!). — India!, Andamans, Penang, Tandjong Londang on W. coast of Malaya!, Siam!, China, Japan, Tahiti. — In sea, estuaries and freshwater.

Type of *Boleophthalmus taylori* seen in Acad. Nat. Sci. Philadelphia.

2. **Parapocryptes** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 327) [1])

Body very elongate, anteriorly subcylindrical, posteriorly compressed, covered with about 80 deciduous cycloid scales. Head subcylindrical, naked or scaled above behind the eyes, laterally scaled from below the eye, on cheek and opercle. Bony interorbital about $^1/_2$ eyediameter. Snout about as long as eye. Nostrils not tubular. Mouth a little oblique, jaws subequal. Teeth in both jaws in one row, in upper jaw anterior ones caninoid; in lower jaw teeth horizontal, pointed, behind symphysis on each side a canine. The upper jaw has a curvity, receiving the tip of lower jaw. Tongue truncate, nearly totally adnate to the floor of the mouth. Gill-openings not very wide, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 I. 19-29; A. I. 19-28. Ventral fins united, oblong. Pectoral fin without free silklike rays, base scaled. Caudal fin pointed.

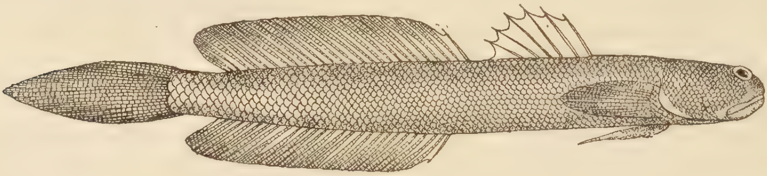

Fig. 61. *Parapocryptes macrolepis* (Blkr.). × $^6/_7$.

Distribution: India to China, Indo-Australian Archipelago.

Key to the Indo-Australian species of Parapocryptes

1. Membrane of last ray of first dorsal fin extends
   to the base of first ray of second dorsal fin.
   Sides of body with large brownish blotches. . 1. *P. macrolepis* p. 251.

---

1) Herre created in Monogr. 23 Bur. Sci. Manila 1927, p. 261 a new subgenus of *Parapocryptes* on the new species *Parapocryptes* (*Paeneapocryptes) mindanensis*. This described species proved to be the young of *Oxyurichthys papuensis* (C.V.), see Koumans, Zool. Meded. Leiden 22, 1940, p. 191.

2. Membrane of last ray of first dorsal fin does not reach the base of first ray of second dorsal fin. Body without blotches . . . . 2. *P. henlei* p. 251.

1. **Parapocryptes macrolepis** (Blkr.) (Fig. 61, p. 250)

Apocryptes macrolepis Bleeker, Nat. Tijdschr. Ned. Indië 2, 1851, p. 66.
Parapocryptes cantonensis Herre, Lingnan Science Journal 11 no. 3, 1932, p. 441.
?*Parapocryptes macrolepis* Hardenberg, Treubia 15, 1936, p. 253.
Parapocryptes cantonensis Koumans, Zool. Meded. Leiden 22, 1940, p. 147 (as synonym).
Parapocryptes macrolepis Koumans, Mem. Indian Mus. 13, 1941, p. 275.

D. 1 VI; D. 2 I. 24-28; A. I. 25-28; P. 20; L.l. about 70-75.

Body very elongate, anteriorly subcylindrical, posteriorly compressed, height $6^1/_2$-7 in length, 11 in total length. Head subcylindrical, 5 in length, 7 in total length. Eye 5 in head, interorbital $^1/_2$ eyediameter or less. Maxillary extends to below posterior margin of eye. In upper jaw anteriorly 6-8 caninoid teeth, laterally 18-24 smaller ones. In lower jaw 18-20 subhorizontal teeth, behind symphysis a pair of canines. Scales of body larger posteriorly. Dorsal fins with the bases scarcely united. Pectoral and ventral fin a little shorter than head. Caudal fin lanceolate. Colour green above, silvery to yellowish below. Snout black. Back and side with smoky reddish blotches. Dorsal fins violet with 4-6 oblique rows of oblong black blotches. Pectoral fin green, blackish towards tip. Ventral fin yellow. Anal fin reddish. Caudal finrays green, membrane blackish-violet. Length 230 mm.

Habitat: Singapore; Pulu Weh!; Java (Surabaja!); Borneo (Bandjermasin, Pontianak, ?Padang Tikar bay). — Ceylon (Colombo!), Andamans, Canton!.

Type of *Apocryptes macrolepis* evidently lost. Paratypes of *P. cantonensis* seen in Stanford University.

2. **Parapocryptes henlei** (Blkr.)

Apocryptes Henlei Bleeker, Verh. Bat. Gen. 22, 1849, p. 37.

D. 1 VI; D. 2 I. 25-27; A. I. 24-28; P. 19-21; L.l. 78-80.

Body very elongate, anteriorly subcylindrical, posteriorly compressed, height $6^2/_3$-7 in length, 10-11 in total length. Head subcylindrical, 5-5$^1/_2$ in length, 7-7$^1/_2$ in total length. Eye 5-7 in head, interorbital less than 1 eyediameter. Maxillary extends to beyond the eye. In upper jaw anteriorly 4-6 larger teeth. Teeth in lower jaw horizontal, behind symphysis a pair of canines. Scales of body larger posteriorly. Membrane of last ray of first dorsal fin ends at a distance from the base of first ray of second dorsal fin. First dorsal fin as high as body, second dorsal fin lower than body. Pectoral and ventral fin a little shorter than head. Caudal fin lanceolate. Colour of head, back and vertical fins green, belly yellowish. Pectoral and ventral fin orange. Length 153 mm.

Nom. indig.: Ikan Njanjan (Jav., Surabaja).

Habitat: Pulu Weh!; Strait Madura! (Surabaja, Kammal). — In sea.

Types seen in the Leiden Museum.

Note: *P. henlei* is close to *P. macrolepis,* perhaps the small differences will prove to be not of specific value.

3. **Apocryptichthys** Day

(Day, Fishes India 1878, p. 302)

Body very elongate, anteriorly subcylindrical, posteriorly compressed, covered with 70-90 cycloid scales, small in the anterior parts of body, becoming larger posteriorly. Head elongate, compressed, scaled above behind the eyes with scales, which are smaller than those of body, or head naked; cheek and opercle scaled or naked. Eye small, bony interorbital and snout about 1 eyediameter. Anterior nostril in a triangular lobule, hanging over the upper lip. Mouth wide, nearly horizontal, lower jaw a little prominent. Teeth in both jaws in one row, obtuse. Anterior teeth in upper jaw large canines. Teeth in lower jaw subhorizontal, a canine on each side behind symphysis. Tongue rounded, nearly totally adnate to the floor of the mouth. Gillopenings narrow, isthmus moderate. Dorsal fins nearly continuous. First dorsal fin with 6 rays. D. 2 I. 24-26; A. I. 23-26. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin oblong, pointed.

Distribution: India, Andamans, Siam, China, Java.

1. **Apocryptichthys cantoris** (Day) (Fig. 62 p. 253)

Apocryptes cantoris Day, Proc. Zool. Soc. London 1870, p. 693.

Apocryptichthys Cantoris Day, Fishes India 1878, p. 302, pl. 62 fig. 7. — Fauna Brit. India Fishes 2, 1889, p. 279, fig. 94.

Apocryptichthys cantoris H. M. Smith, Journ. Siam Soc. Nat. Hist. Suppl. 8 no. 3, 1931, p. 189.

Apocryptichthys cantoris Koumans, Zool. Meded. Leiden 15, 1932, p. 16. — Mem. Indian Mus. 13, 1941, p. 276.

D. 1 VI; D. 2 I. 26; A. I. 25; P. 19; L.l. ± 90; L.tr. 17.

Body very elongate, height 5-6 in length, about 9 in total length. Head depressed, 4-4$^1/_2$ in total length. Eye not prominent, 6 in head, interorbital $^2/_3$ eyediameter. Snout 1 eyediameter, tip before lower margin of eye. Anterior nostril in a triangular lobule, hanging over upper lip. Maxillary extends to one eyediameter behind eye, or not so far. Teeth in upper jaw anteriorly caninoid. In lower jaw the teeth are horizontal, curved upwards, laterally obtuse, not bilobate. A pair of canines behind symphysis. Scales minute. Head naked? Gillopenings narrow, before lower half of base of pectoral fin. The membrane behind the last ray of first dorsal fin is almost continued to the base of second dorsal fin. Foremost three rays of first dorsal fin prolonged. Dorsal fins of the same height. Base of pectoral fin fleshy, but not muscular. Pectoral fin as long as postorbital part of head. Caudal fin pointed, but shorter than head. Colour olive. First dorsal fin dark, with three black longitudinal bands. Upper part of caudal fin spotted. Cheek and lower surface of head with black spots. Length 100 mm.

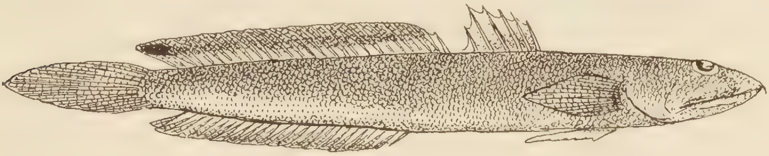

Fig. 62. *Apocryptichthys cantoris* (Day). × 1½.

Habitat: Pulu Weh!; Java (eastern part!, Surabaja!). — Madras, Andamans!, Gulf of Siam.

Specimen from collection Day seen in British Museum (N.H.).

4. **Apocryptodon** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 327)

Body very elongate, anteriorly subcylindrical, posteriorly compressed, covered with 40-78 deciduous cycloid scales. Head posteriorly subcylindrical, anteriorly a little depressed, scaled above behind the eyes, laterally scaled from under the eye, on cheek and opercle. Scales behind the eyes about of the same size as those of body. Bony interorbital less than 1 eyediameter. Snout a little more than 1 eyediameter. Nostrils not tubular. Mouth nearly horizontal, jaws subequal. Teeth in both jaws in one row, in upper jaw caninoid, in lower jaw horizontal, truncate to bilobate. A pair of canines behind symphysis of lower jaw. The upper jaw has a curvity, receiving the tip of the lower jaw. Tongue rounded, nearly totally adnate to the floor of the mouth. Gillopenings about as long as the breadth of the base of pectoral fin, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 I. 22-27; A. I. 21-27. Ventral fins united, oblong. Pectoral fin without free silklike rays, base scaled. Caudal fin pointed.

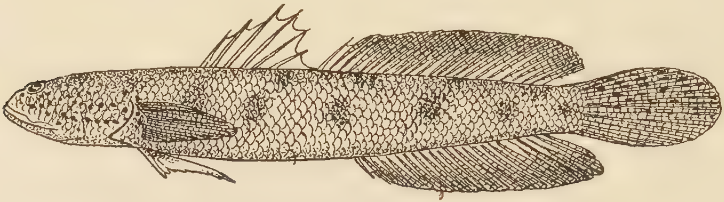

Fig. 63. *Apocryptodon madurensis* (Blkr.). × $1^1/_4$.

Distribution: India to Japan, Indo-Australian Archipelago.

Key to the Indo-Australian species of Apocryptodon

1. L.l. about 50-55; D. 2 I. 22; A. I. 22. . . . . . 1. *A. madurensis* p. 254.
2. L.l. about 78; D. 2 I. 27?; A. I. 27? . . . . . 2. *A. wirzi* p. 256.

1. **Apocryptodon madurensis** (Blkr.) (Fig. 63, p. 254)

Apocryptes madurensis Bleeker, Verh. Bat. Gen. 22, 1849, p. 35.
Apocryptes glyphisodon Bleeker, o.c. p. 36.
Apocryptes madurensis Günther, Cat. Fishes 3, 1861, p. 84.
Apocryptes glyphidodon Günther, o.c. p. 84.
Apocryptes madurensis Day, Proc. Zool. Soc. London 1873, p. 109.
Apocryptes Bleekeri Day, Fisoes India 1878, p. 300, pl. 64 fig. 3.
Apocryptes bleekeri Day, Fauna Brit. India Fishes 2, 1889, p. 276.
Apocryptodon montalbani Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 277, pl. 22 fig. 2.
Apocryptodon sealei Herre, o.c. p. 278.

Apocryptodon taylori Herre, o.c. p. 279, pl. 22 fig. 3.
Apocryptodon malcolmi H. M. Smith, Proc. U.S. Nat. Mus. 79 art. 7, 1931, p. 47, fig. 22.
Apocryptodon punctatus Tomiyama, Journ. Fac. Sci. Tokyo 3 no. 3, 1934, p. 332, figs. 4, 5.
Apocryptodon bleekeri Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 97, fig. 41.
Apocryptodon malcolmi Koumans, Zool. Meded. Leiden 22, 1940, p. 130 (as synonym).
Apocryptodon montalbani Koumans, o.c. p. 191 (as synonym).
Apocryptodon sealei Koumans, o.c. pp. 154, 191 (as synonym).
Apocryptodon taylori Koumans, o.c. p. 191 (as synonym).
Apocryptodon glyphisodon Koumans, Mem. Indian Mus. 13, 1941, p. 277.

D. 1 VI; D. 2 I. 22; A. I. 22; P. 22; L.l. ± 50-55; L.tr. 13; Predorsal scales ± 20.

Body very elongate, compressed, height $5^{1}/_{2}$-$6^{1}/_{2}$ in length, 8-9 in total length. Head subcylindrical, 4 in length, 5 in total length. Eye 6 in head, interorbital $^{1}/_{2}$ eyediameter. Snout as long as, or a little longer than eye, tip below lower margin of eye. Mouth oblique, upper jaw prominent. Maxillary extends to beyond eye. Teeth in upper jaw 8-16 on each side, in lower jaw horizontal, bilobate, 12-30 on each side. A pair of canines behind symphysis of lower jaw. Scales cycloid, becoming larger posteriorly. Head scaled above behind eye, on cheek and opercle. Dorsal fins subcontinuous, the membrane behind the sixth ray of first dorsal fin is connected with the first ray of second dorsal fin. First dorsal fin about as high as body, third and fourth rays are filiform. Second dorsal and anal fin lower than first dorsal fin. Pectoral fin as long as postorbital part of head. Ventral fin a little shorter. Caudal fin a little longer than head. Colour grayish, laterally with 5 indistinct red blotches. Lower part of head with numerous black spots. Pectoral fin darker towards lower margin, lower margin bordered with white. Anal fin dark. Caudal fin darker towards lower margin, lower margin bordered with white. Length 77 mm.

Nom. indig.: Ikan puntang (Jav. Surabaja), Ikan tjentjen tengeh (Mad. Bangcallang).

Habitat: Singapore; Java (Djakarta, Surabaja, eastern part of Java!); Bawean, Madura. — India!, Siam!, Philippines!, Japan.

Specimens of Bleeker's collection of *Apocryptodon madurensis* and *A. glyphisodon* seen in the Leiden Museum, 2 specimens of

Day's collection of *A. bleekeri* seen in British Museum (N.H.), type of *A. malcolmi* seen in U.S. Nat. Museum, type of *A. montalbani, A. sealei* and *A. taylori* seen in Bureau of Science, Manila.

Note: The three described species, *A. madurensis, glyphisodon* and *bleekeri* are united here. *A. madurensis* Blkr. and *glyphisodon* Blkr. differ according to the descriptions by Bleeker especially in the number of teeth in upper and lower jaw. The number of these teeth, studied after specimens of Bleeker's collection, is not so evident as described. The number of scales in L.l. in *madurensis* is not about 35, but 45-48, the interorbital is not one, but a half eyediameter, the number of rays of pectoral fin is 22, not 16.

The number of teeth of the 3 species was found to be:

	A. madurensis	*A. bleekeri*	*A. glyphisodon*
in upper jaw on each side	13-15	16	8-11
in lower jaw on each side	25	30	12-18

A. glyphisodon is described to have 5 indistinct red blotches laterally on body, lower part of head with numerous black spots. In *A. bleekeri* these spots on lower part of head are feebly developed, in the specimens of *A. madurensis,* which are however not in a fine state, no spots or blotches were found. The teeth of the specimens, which I studied, vary considerably and are always partly broken off, or partly mutilized, therefore it is difficult to state exactly the number for each specimen, which number often is different for the two halves of the jaw. So I cannot regard *A. glyphisodon* and *madurensis* as distinct species. Perhaps that the study of freshly caught specimens shows that there is a variety with, and a variety without spots on head and blotches on the sides of the body.

2. **Apocryptodon wirzi** Koumans

Apocryptodon wirzi Koumans, Zool. Meded. Leiden 20, 1937, p. 26.

D. 1 VI; D. 2 I. 27?; A. I. 27?; L.l. ± 78; L.tr. 18; Predorsal scales ± 32.

Body elongate, compressed, height 7 in length, $8^1/_2$ in total length. Head depressed, 4 in length, 5 in total length. Eye about 7 in head, interorbital less than 1 eyediameter. Snout about as long as eye, tip before inferior margin of eye. Teeth in upper jaw in a row of about 14 teeth on each side, which are truncate to bilobate; before these 14 teeth, on each side a curved canine. In lower jaw a row of about 20 teeth on each side, which are subhorizontal and bilobate; before these teeth, on each side 1-2 curved canines. On each side of symphysis an erected canine. Tongue nearly totally adnate to the floor of the mouth. Head scaled above behind the eyes, on cheek and opercle. Scales of body cycloid, a little deciduous, about as large as those on head. First dorsal fin lower than body, longer than high. Second dorsal fin very close behind the end of the membrane of first dorsal fin. Pectoral fin about as long as postorbital part of head. Ventral fin of the same length. Caudal fin about as long as head. Colour grayish brown, silvery below. Head with a dark blotch on each side on cheek and opercle. Body with about 15 indistinct bent transverse stripes. Second dorsal fin with a dark blotch at the tip of the last rays. Pectoral fin with dark transverse band on base. Anal and ventral fin light. Length 88 mm.

Habitat: British New Guinea (Turama river in Western Division!).

Type in the Basle Museum seen by us.

2. Phalanx BOLEOPHTHALMI

Eyes erectible above the dorsal profile of head, with a free lower eyelid. First dorsal fin higher than long.

Key to the Indo-Australian genera of Boleophthalmi

1. Mandibular teeth obliquely notched. Scales small, about 100 in L.l. No barbels on head . . . . 1. *Boleophthalmus* p. 257.
2. Mandibular teeth pointed. Scales minute, rudimentary. Lower side of head with barbels . . . . 2. *Scartelaos* p. 262.

1. **Boleophthalmus** Cuvier & Valenciennes

(Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 198)

Body very elongate, compressed, covered with 60 to more than 100 cycloid scales, becoming larger posteriorly. Head subcylindrical, covered with a warty skin, totally scaled, or scales rudimentary.

Eyes very close together, movable to above the dorsal profile of head, lower eyelid well developed. Snout blunt, about as long as eye. Mouth a little oblique, jaws subequal. Teeth in both jaws in one row. In upper jaw conical, anterior ones caninoid. In lower jaw subhorizontal, flattened and obliquely notched; on each side of symphysis a curved canine. Tongue truncate, nearly totally adnate to the floor of the mouth. No barbels on head. Gillopenings obliquely placed, about as long as the breadth of base of pectoral fin, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate to connected at their bases. First dorsal fin with 5 rays. D. 2 I. 22-27; A. I. 23-26. Ventral fins united, oblong. Pectoral fin without free silklike rays, base muscular, scaled. Caudal fin asymmetrical, the upper half a little longer, oblong.

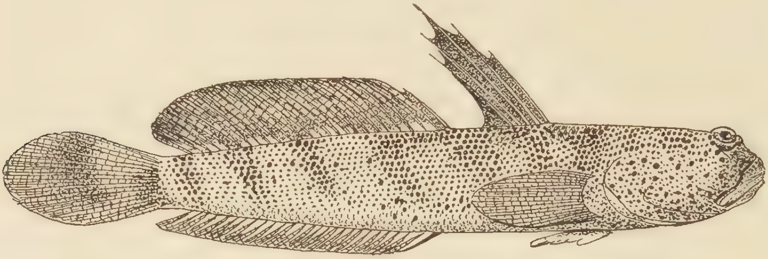

Fig. 64. *Boleopthalmus boddarti* (Pall.) × 3/4.

Distribution: From Shat-el-Arab (Mesopotamia) to Japan, Australia and Goram.

Key to the Indo-Australian species of Boleophthalmus

1. Dorsal fins without blue spots. On side of body oblique bands. . . . . 1. *B. sculptus* p. 258.
2. Dorsal fins with blue spots. On side of body oblique bands. L.tr. 2 11. . . . . 2. *B. boddarti* p. 259.
3. Dorsal fins with blue spots. On side of body no oblique bands. L.tr. 2 17 . . . 3. *B. pectinirostris* p. 261.

1. **Boleophthalmus sculptus** Gthr.

Boleophthalmus sculptus Günther, Cat. Fishes 3, 1861, p. 104.
Boleophthalmus sculptus Day, Fishes India 1878, p. 308. — Fauna Brit. India Fishes 2, 1889, p. 286.
?*Boleophthalmus sculptus* Volz, Zool. Jahrb. Syst. 19, 1903, p. 364.
Boleophthalmus sculptus Koumans, Mem. Indian Mus. 13, 1941, p. 280.

D. I V; D. 2 I. 24; A. I. 23; P. 15; L.tr. 1 12; L.tr. 28.

Body very elongate, height $6^1/_2$ in total length. Head $4^1/_2$ in total length. Eye $4^1/_2$ in head, close together. Snout as long as eye. Six canines in front of upper jaw. Scales cycloid, on head and anterior part of body rudimentary, with flat, rounded tubercles. Third ray of first dorsal fin filiform. Pectoral fin rather short. Caudal fin rhomboid. Colour according to Günther "body greenish-olive, yellowish on belly; six rather indistinct darker bands descend obliquely from the back towards the belly; the anterior dorsal greyish, the other fins reddish." Length 80 mm.

Habitat: ?Sumatra (Tandjung laut at Bantung river near Palembang). — India (Günther), Bombay (Day).

This species was not seen by us.

Note: Volz, l.c., states this species from Sumatra. The 3 specimens could, however, not be found when I was in the Museum of Bern, so that I could not study them in order to see whether the identification by Volz was right. The statement by M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 262 of *B. sculptus* from Merauke, New Guinea, is erroneous, as the specimens belong to *B. boddarti* (Pall.).

2. **Boleophthalmus boddarti** (Pall.) (Fig. 64, p. 258)

Gobius Boddarti Pallas, Spicilegia 8, 1770, p. 11, pl. 2 figs. 4, 5.
Eleotris Boddarti Bloch ed. Schneider, Syst. Ichth. 1801, p. 66.
Gobius striatus Bloch ed. Schneider, o.c. p. 71, pl. 16 (fem.).
Gobius plinianus Hamilton Buchanan, Gangetic Fishes 1822, pp. 45, 366, pl. 35 fig. 13.
Boleophthalmus Boddaerti Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 199.
Boleophthalmus Plinianus Cuvier & Valenciennes, o.c. p. 205.
Boleophthalmus Boddaerti Bleeker, Verh. Bat. Gen. 22, 1849, p. 40.
Boleopthalmus boddaerti Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1174.
Boleophthalmus boddaertii Günther, Cat. Fishes 3, 1861, p. 102.
Boleophthalmus Boddaerti Day, Fishes India 1878, p. 307, pl. 65 fig. 2. — Fauna Brit. India Fishes 2, 1889, p. 285.
Boleophthalmus sculptus M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 262 (not of Gthr.).
Boleophthalmus boddaerti Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 418.
Boleophthalmus boddarti Koumans, Mem. Indian Mus. 13, 1941, p. 280.

D. 1 V; D. 2 I. 24-27; A. I. 26; P. 18-19; L.l. 75-100; L.tr. 1 19; L.tr. 2 11.

Body very elongate, subcylindrical anteriorly, compressed posteriorly, height 6-7 in total length. Head a little compressed, 5-5$^{1}/_{3}$ in total length. Eye 6 in head, interorbital less than $^{1}/_{2}$ eyediameter. Snout obtuse, not longer than eye. Maxillary extends to behind eye. Teeth in upper jaw in front 4-6 canines. In lower jaw about 30 teeth on each side. Scales cycloid, on head and anterior part of body with a tubercle. First dorsal fin higher than body, rays filiform. Colour darkish-green with 6-7 dark spots or oblong bands. Head with blue or brown spots. First dorsal fin with or without black spot between second and fourth ray. First dorsal fin with blue spots. Second dorsal fin with 4 irregular longitudinal rows of blue spots. Length 220 mm.

Nom. indig.: Ikan Blodo Tjina (Mal. Djakarta, Malacca), Ikan Blodok (Jav. Semarang), Lundjat, Glodog (Jav.), Layar (Djiwana), Ikan tembakul (Borneo).

Habitat: Singapore (Pulu Ubin!); Banka; Sumatra (Atjeh!, Sungei Serdang river!, Belawan!, river Betsch!); Java (Djakarta!, Semarang, Djiwana!, Surabaja!, Penumbukan!, Besoeki!, Tjemara!, Karangbollong); Madura! (Kammal, Sumanep); Borneo (Pamangkat, Sinkawang, Sungi duri, Bandjermasin, Samarinda!, Sambas, Seminis, Upper Riko!, Padang Tikar bay!); Pulu Laut (Setasin!); Celebes (Makassar!); New Guinea (Merauke!, Lorentz river). — India!, Andamans, Malacca, Siam!, China!, Guam. — In rivers, estuaries and sea.

Note: Bleeker mentions some varieties in his M.S.
variety a. Body with 7 transverse stripes, head with many blue spots. Pectoral fin yellow, bordered with black. Ventral fin yellow. L.l. ± 80. *Gobius plinianus* H. B. (Surabaja).
variety b. Body dark, laterally 6-7 dark spots, head with many pearl-like spots. First dorsal fin with 2 longitudinal black spots between second and fourth ray. Margin of opercle black. Pectoral and ventral fin dark. L.l. 100. (Djakarta, Semarang).
variety c. Like b, but first dorsal fin much lower, margin of opercle not black. (Sumanep).
variety d. Like b, but without black spots on first dorsal fin. (Djakarta).
variety e. Body darkish-red, without spots and stripes. Two dark

spots between second and fourth rays of first dorsal fin. Margin of opercle black. Pectoral and ventral fin dark. (Djakarta).

3. **Boleophthalmus pectinirostris** (L.)

Apocryptes chinensis Osbeck, Amoen. Acad. 1754, p. 29, fig. 23 1).
Gobius pectinirostris Linnaeus, Syst. Nat. ed. 10, vol. 1, 1758, p. 264.
Gobius pectinirostris Gmelin in Linnaeus, Syst. Nat. ed. 13, vol. 1 pars 3, 1789, p. 1200.
Gobius pectinirostris Lacépède, Hist. Nat. Poissons 4, 1800, p. 348.
Apocryptes pectinirostris Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 150.
Boleophthalmus boddaerti Richardson, Ichth. China, Rep. Brit. Ass. Adv. Sci. (1845) 1846, p. 208 (not of Pall.).
Boleophthalmus pectinirostris Richardson, o.c. p. 208.
Boleopthalmus pectinirostris Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1175.
Boleophthalmus boddaerti Temminck & Schlegel, Fauna Japonica Poissons 1850, p. 148, pl. 76 fig. 3 (not of Pall.).
Boleophthalmus pectinirostris Günther, Cat. Fishes 3, 1861, p. 102.
Boleophthalmus pectinirostris Day, Fishes India 1878, p. 308. — Fauna Brit. India Fishes 2, 1889, p. 286.
?*Boleophthalmus pectinirostris* Karoli, Termeszetrajzi füzetek 5, 1882, p. 21.
Boleophthalmus chinensis Jordan & Snyder, Proc. U.S. Nat. Mus. 24, 1902, p. 47.
?*Boleophthalmus caeruleomaculatus* McCulloch & Waite, Rec. South Austral. Mus. 1 prt. 1, 1918, p. 79, pl. 8 fig. 1.
Boleophthalmus chinensis Herre, Monogr. 23 Bur. Sci. Manila, 1927, p. 323, pl. 25 fig. 1.
Boleophthalmus caeruleomaculatus Koumans, Zool. Meded. Leiden 22, 1940, p. 172 (as probable synonym).
Boleophthalmus pectinirostris Koumans, Mem. Indian Mus. 13, 1941, p. 281.

D. 1 V; 2 I. 23-26; A. I. 23-26; P. 17-20; L.l. ± 100; L.tr. 1 20; L.tr. 2 17.

Body very elongate, anteriorly subcylindrical, posteriorly compressed, height $6^1/_4$ in length, 7-8 in total length. Head subcylindrical, $4^1/_5$ in length, 5 in total length. Eye $5^1/_2$-7 in head, interorbital less than $^1/_2$ eyediameter. Snout obtuse, not longer than eye. Jaws subequal. Maxillary extends to a little behind the eye. Teeth in upper jaw pointed, not truncate, 3-4 canines on each side

---

1) The name *Apocryptes chinensis* Osbeck is cited by Linnaeus, Syst. Nat. ed. 10, 1878, p. 264 as "iter 130". The statement of authors that the name *Apocryptes chinensis* occurs in the German translation of Osbeck of 1765 (or other dates as given by them) is wrong. On p. 170 and 291, the fish to which they refer is named *Gobius pectinirostris* L. Syst. Nat. The name *Apocryptes chinensis* is not stated in Sherborn's Index Animalium.

in front, other teeth much smaller. Teeth in lower jaw subhorizontal, tip obliquely truncate to emarginate, a pair of canines behind symphysis. Head and anterior part of body with conical papillae, the scales of body become larger posteriorly. First dorsal fin much higher than body, middle rays prolonged. Second dorsal fin lower than body. Anal fin lower than second dorsal fin. Pectoral fin about as long as head. Caudal fin obtuse, obliquely rounded, about as long as head. Colour violet green to olivous above, lighter below. Body laterally with irregular light spots and blackish tubercles. Dorsal fins deep violet to purple, rays dark red. Membrane of first dorsal fin with many small blue ocelli, bordered by black, or vertically placed lilac spots. Membrane of second dorsal fin between the rays with oblong horizontal spots, bordered by black, placed in 6-9 vertical rows. Other fins violet to dusky. Caudal fin with transversal rows of lilac spots, membrane brownish black. Second dorsal, caudal and anal fin bordered with orange. Anterior scaly part of pectoral fin with blackish crescent shaped margin. Branchiostegal membrane violet. Length 115 mm.

Habitat: ?Borneo. — Birma, Penang, China, Japan!, ?Philippines, ?Australia (Adelaide river in Northern Territory!).

Holotype and paratypes of *Boleophthalmus caeruleomaculatus* seen in Museum Adelaide.

Note: Karoli, l.c., states Borneo as locality for this species. We could not prove this statement. It may be that the identification is erroneous.

2. **Scartelaos** Swainson

(Swainson, Nat. Hist. Class. Fish. 2, 1839, pp. 183, 279)

Boleops Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 271.

Body very elongate, subcylindrical anteriorly, compressed posteriorly, naked or covered with minute rudimentary scales, becoming a little larger posteriorly. Head a little depressed, covered with a warty skin. Eyes close together, movable to above the dorsal profile of head, lower eyelid well developed. Snout blunt, about as long as eye. Mouth a little oblique, upper jaw a little prominent. Along the lower side of the head on each side, parallel to the margin of mandibula, a row of short barbels. Teeth in both jaws in a single row; in upper jaw caninoid; in lower jaw anteriorly subhorizontal, posteriorly more erect; in both jaws pointed. A pair of canines behind symphysis of lower jaw. Tongue rounded, nearly totally adnate to the floor of the mouth. Gillopenings narrow, a little obliquely placed between the bases of pectoral and ventral fin,

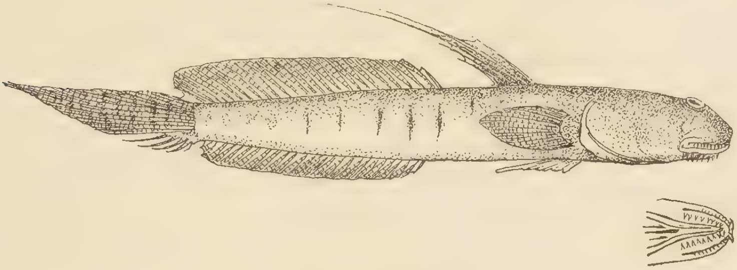

Fig. 65. *Scartelaos viridis* (H. B.). n.s.

isthmus moderate. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins separate. First dorsal fin with 5-6 rays. D. 2 I. 24-28; A. I. 23-25. Ventral fins united, oblong. Pectoral fin without free silklike rays, base muscular. Caudal fin asymmetrical, rays of upper half longer, pointed.

Habitat: Mesopotamia to the Pacific.

1. **Scartelaos viridis** (H. B.) 1) (Fig. 65, p. 263)

Gobius viridis Hamilton Buchanan, Gangetic Fishes 1822, pp. 42, 366, pl. 32 fig. 12.
Boleophthalmus histophorus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 210.
Boleophthalmus viridis Cuvier & Valenciennes, o.c. p. 213.
?*Boleopthalmus sinicus* Cuvier & Valenciennes, o.c. p. 215.
?*Boleophthalmus chinensis* Cuvier & Valenciennes, o.c. p. 215.
Boleophthalmus aucupatorius Richardson, Voy. Sulphur Fishes 1842, p. 148, pl. 42 figs. 1, 2.
Boleophthalmus viridis Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1177.
Boleophthalmus viridis Günther, Cat. Fishes 3, 1861, p. 104.
Apocryptes macrophthalmus Castelnau, Proc. Zool. Soc. Victoria 2, 1873, p. 87.

---

1) According to Whitley, Rec. Austral. Mus. 19, 1933, p. 92, the name *Gobius viridis* H. B. is preoccupied by *Gobius viridis* Otto 1821. He proposes for the Australian form the name *Scartelaos macrophthalmus* (Castelnau). He does not state the points in which Australian specimens differ from specimens from other localities. When the name is preoccupied, the name should become *Scartelaos histophorus* (C. V.).

Boleophthalmus viridis Day, Fishes India 1878, p. 307, pl. 66 fig. 5. — Fauna Brit. India Fishes 2, 1889, p. 285.
Gobiosoma guttulatum Macleay, Proc. Linn. Soc. N.S. Wales 2, 1878, p. 357, pl. 9 fig. 6.
Gobiosoma punctularum De Vis, o.c. 8, 1884, p. 449.
Scartelaos viridis, Jordan & Seale, Proc. U.S. Nat. Mus. 28, 1905, p. 794, fig. 5.
Pseudapocryptes punctularum Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 408.
Boleophthalmus viridis M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 262. — Siboga Exp. Fische 1913, p. 485.
Boleophthalmus novaeguineae Hase, Jen. Zeitschr. f. Naturwiss. 51, 1914, p. 534, figs. 7, 8, 9.
Scartelaos viridis McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 200, pl. 32 fig. 1.
Boleophthalmus viridis Vinciguerra, Ann. Mus. Civ. Genova 50 (3^a ser. 10), 1926, p. 552.
Scartelaos viridis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 325, pl. 25 fig. 2.
Boleophthalmus viridis Fowler, Mem. B. P. Bishop Mus. 10, 1928, p. 418.
Boleophthalmus viridis Wu, Contr. Biol. Lab. Sci. Soc. China 7 Zool. Ser, 1931, p. 54.
Gobiosoma guttulatum Koumans, Zool. Meded. Leiden 22, 1940, p. 158 (as synonym).
Gobiosoma punctularum Koumans, o.c. p. 174 (as synonym).
Scartelaos viridis Koumans, Mem. Indian Mus. 13, 1941, p. 283.

D. 1 V; D. 2 I. 25-26; A. I. 23-26; P. 21.

Body very elongate, height $6^1/_2$-9 in length, $8^3/_4$-10 in total length. Head depressed, $3^1/_2$-$4^1/_2$ in length. Eyes close together, $5^3/_4$-$6^1/_2$ in head. Snout broad, $3^1/_2$-4 in head. Nostrils ending anteriorly in a free flap. Mouth horizontal, upper jaw prominent. Maxillary extends to below posterior margin of eye, or farther. Teeth in upper jaw anteriorly 12-14 canines, laterally the teeth are smaller. In lower jaw 24-30 horizontal teeth, a pair of canines behind symphysis. A row of barbels along the ramus of lower jaw. Scales of body small, rudimentary. Head naked, warty. Dorsal fins widely separate. Base of first dorsal fin short. First dorsal fin higher than body, third ray is the longest. Second dorsal fin a little lower than body, last ray mostly connected by membrane to the caudal fin. Anal fin lower than second dorsal fin. Pectoral fin rounded, much shorter than head, base muscular. Ventral fin as long as pectoral fin. Caudal fin lanceolate, longer than head. Colour slaty blue above, lighter below. On head, base of pectoral fin, back and dorsal fins small black spots. On lower half of body some (4-6) short transversal, brownish bars. Upper part of caudal fin with dark bands, lower part white, tip black. Length 140 mm.

Habitat: Java (Djakarta!, Krawang!); Madura (Pamekasan!;); Borneo! (Sarawak); Celebes (Makassar!); New Guinea (mouth of Merauke river!, Tami river, Turama river!). — India!, Penang, Siam, China!, Philippines, North and Northeast Australia (Port Darwin!), South Sea Islands. — In sea.

Types of *Boleophthalmus aucupatorius* seen in British Museum (N.H.), types of *Gobiosoma guttulatum* seen in Macleay Museum, Sydney, type of *Gobiosoma punctularum* seen in Queensland Museum, Brisbane.

2. Family TAENIOIDIDAE

Gobioidea with united ventral fins, one dorsal fin, which is very elongate, with a distinct short spinous part. Eye small to indistinct. Isthmus broad. Naked or with cycloid scales.

Distribution: Tropical regions of America, Indic, Pacific.

Key to the subfamilies of Taenioididae

1. No pit in upper margin of opercle, opening to a cavity, which is separate from the gillcavity . 1. *Taenioininae* p. 265.
2. A pit in upper margin of opercle, opening to a cavity, which is separate from the gillcavity . 2. *Trypaucheninae* p. 276.

1. Subfamily TAENIOININAE

Body very elongate, eel-like, no pit at the upper margin of opercle, opening to a cavity, which is separate from the gillcavity. Eyes small, rudimentary.

Key to the Indo-Australian genera of Taenioininae

1. No barbels on head. No canines . . . . . . 1. *Brachyamblyopus* p. 266.
2. Barbels on head. Canines in both jaws.
    A. Pectoral fin much shorter than ventral fin, about 3 in head. Mouth nearly vertical. . . . . 2. *Taenioides* p. 269.
    B. Pectoral fin as long as ventral fin, about 1½ in head. Mouth very oblique . . . . 3. *Odontamblyopus* p. 274.

1. **Brachyamblyopus** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 329)

Trypauchenopsis Volz, Zool. Anz. 26, 1903, p. 554. — Zool. Jahrb. Syst. 19 Heft 4, 1903, p. 366.
?*Caragobius* Smith & Seale, Proc. Biol. Soc. Washington 19, 1906, p. 81.
Trypauchenophrys Franz, München Abh. Ak. Wiss. Math. Ph. Kl. Suppl. Bd. 4, 1910, p. 68.
Pseudotrypauchen Hardenberg, Treubia 13 Livr. 3-4, 1931, p. 418.
?*Caragobioides* H. M. Smith, Bull. 188 U.S. Nat. Mus., 1945, p. 571.

Body very elongate, compressed, covered with about 50-70 rudimentary scales to naked. Head compressed to depressed. Eye rudimentary. Mouth oblique, lower jaw a little prominent. Teeth in both jaws in 2-3 rows, outer one enlarged, no canines. Tongue rounded. No pouch-like depression in opercular region. No barbels. Gillopenings about as long as the breadth of base of pectoral fin, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. Dorsal fins continuous, about 6 simple rays and 26-45 branched rays. A. I. 26-39. Both fins are connected with the caudal fin. Ventral fins united, oblong. Pectoral fin without free silklike rays. Caudal fin pointed, long.

Distribution: Persian Gulf and east coast of Africa to the Pacific.

Key to the Indo-Australian species of Brachyamblyopus

A. Scales on body present, not only on caudal part.
  1. Scales in L.l. about 70. Head naked. D. VI. 29; A. I. 27 . . . . 1. *B. brachysoma* p. 266.
  2. Scales in L.l. about 50. Head scaled. D. VI. 30-34; A. I. 28-32. . . . . 2. *B. multiradiatus* p. 267.
B. Scales only developed on caudal part, anterior part naked.
  1. D. VI. 45; A. I. 39 . . . . 3. *B. coecus* p. 268.
  2. D. VI. 32; A. I. 33 . . . . 4. *B. urolepis* p. 268.
  3. D. VI. 28; A. I. 26 . . . . 5. *B. intermedius* p. 269.

1. **Brachyamblyopus brachysoma** (Blkr.)

Amblyopus brachysoma Bleeker, Nat. Tijdschr. Ned. Indië 5, 1853, p. 510.
Amblyopus brachysoma Günther, Cat. Fishes 3, 1861, p. 136.
Taenioides herrmannianus M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 603 (not of Lac.).
Brachyamblyopus brachysoma Koumans, Mem. Indian Mus. 13, 1941, p. 299.

D. VI. 29; A. I. 27; P. 21; L.l. ± 70; L.tr. ± 16.

Body compressed, height $7^1/_2$-8 in length, 9-$9^1/_2$ in total length. Head obtuse, subcylindrical, 5 in length, $6^1/_2$ in total length. Profile convex. Eyes very small. Mouth oblique, lower jaw prominent. Maxillary $2^1/_3$-$2^1/_4$ in head. Teeth in upper jaw in 2 rows, the outer enlarged, of about 30 teeth. Teeth in lower jaw in front in 3 rows, laterally in 2 rows, outer enlarged. Head naked. Body scaled from a little before the insertion of first dorsal fin. Dorsal and anal fins lower than body. Pectoral fin obtuse. Ventral fin rounded. Caudal fin oblong. Colour of body and fins pink. Upper part of back and caudal peduncle dusky. Length 105 mm.

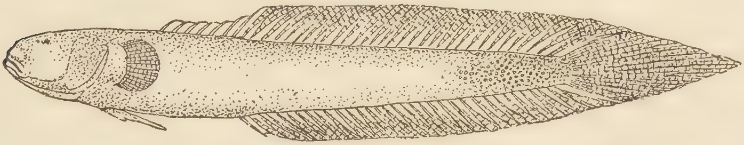

Fig. 66. *Brachyamblyopus urolepis* (Blkr.). × $1^1/_3$.

Habitat: Sumatra (Priaman!); Celebes (Menado); New Guinea (Lorentz river!). — Persian Gulf!, India!, Siam (Bangkok), Hongkong. — In rivers and estuaries.

Type seen in the Leiden Museum.

2. **Brachyamblyopus multiradiatus** (Hardenberg)

Pseudotrypauchen multiradiatus Hardenberg, Treubia 13, 1931, pp. 146, 418, fig. 8.

Brachyamblyopus multiradiatus Koumans, Mem. Indian Mus. 13, 1941, p. 299.

D. VI. 30-34; A. I. 28-32; P. 40; L.l. ± 50; L.tr. ± 8.

Body compressed, height 5 in length, 7 in total length. Head obtuse, 5 in length, 7 in total length. Profile convex. Eyes very small. Mouth oblique. Maxillary $1^1/_2$ in head. Teeth in upper jaw in outer row about 30 on each side. Head and body scaled, scales large, deciduous. Dorsal and anal fins lower than body. Pectoral fin pointed, longer than head. Caudal fin pointed, very long, about 3 in total length. Colour pale rosa. Length 87 mm.

Habitat: Sumatra (Bagan Si Api Api!). — India (mouth of river Hooghly!).

Type seen in the former Laboratorium voor het Onderzoek der Zee at Djakarta.

3. **Brachyamblyopus coecus** (M. Weber)

Taenioides coecus M. Weber, Siboga Exp. Fische 1913, p. 486.

D. VI. 45; A. I. 39.

Body compressed, height about 7 in length. Head compressed, $5^1/_3$ in length. Front convex. Eyes nearly absent. Mouth very oblique, lower jaw prominent. Lips thin. Maxillary 3 in head. Six to eight bent teeth on each side in the jaws in outer row. Teeth in upper jaw in 3 rows, outer row a little enlarged. Body naked, except the posterior $^1/_4$ of body, which has rhombic scales. Vertical fins confluent. Caudal fin pointed, about as long as head. Ventral fin $^1/_3$ of length of head, membrane emarginate. Colour in spirits grayish brown, in life reddish. Length 46 mm.

Habitat: Sumbawa (Bay of Bima!).

Types seen in the Amsterdam Museum.

4. **Brachyamblyopus urolepis** (Blkr.) (Fig. 66, p. 267)

Amblyopus urolepis Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 581.
Amblyopus urolepis Günther, Cat. Fishes 3, 1861, p. 136.
Taenioides spec. De Beaufort, Bijdragen Dierkunde 1913, p. 147.
Brachyamblyopus olivaceus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 329, pl. 25 fig. 3.
?*Caragobius geomys* Fowler, Proc. Ac. Nat. Sci. Philad. 87, 1935, p. 161, fig. 129, p. 130.
?*Taenioides anotus* Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 101, fig. 42 (not of Franz?).
Brachyamblyopus olivaceus Koumans, Zool. Meded. Leiden 22, 1940, p. 194 (as synonym).
Brachyamblyopus urolepis Koumans, Mem. Indian Mus. 13, 1941, p. 299.
?*Caragobioides geomys* H. M. Smith, Bull. 188 U.S. Nat. Mus., 1945, p. 571.

D. VI. 32; A. I. 33; P. 18.

Body compressed, height 9 in length. Head subcylindrical, $5^1/_2$ in length, 7 in total length. Front a little convex. Eyes very small. Mouth very oblique, lower jaw prominent. Lips thin. Maxillary 3 in head. Teeth subequal, a little curved. Teeth in upper jaw in 2 rows, in lower jaw in more rows. Only small scales on caudal part of body. Dorsal and anal fins lower than body. Pectoral fin short, rounded, $^1/_2$ of length of head. Caudal fin longer than head, pointed. Colour reddish green. Fins red. Length 81 mm.

Habitat: Sumatra (Palembang!, Sungsang!); Java (Tjilintjing near Djakarta!, eastern part of Java!); Timor (near Kupang!); Celebes!; Ceram (Kairatu!). — India!, Andamans!, Siam (mouth of Chao Phya!), ?Japan, Philippines!. — In rivers and estuaries.

Type of *Amblyopus urolepis* seen in the Leiden Museum, type of *Brachyamblyopus olivaceus* seen in Bureau of Science, Manila.

5. **Brachyamblyopus intermedius** (Volz)

Trypauchenopsis intermedius Volz, Zool. Anz. 26, 1903, p. 555. — Zool. Jahrb.. Syst. 19 Heft 4, 1903, p. 366.

D. VI. 28; A. I. 26.

Body compressed posteriorly, height about 14 in length, about 19 in total length. Head $7^1/_2$ in length, $2^1/_2$ in distance of ventral fin to vent. Eyes very small. Maxillary $2^1/_2$ in head. Body naked. Pectoral fin a little shorter than ventral fin. Caudal fin more than two times length of head. Length 95 mm.

Habitat: Sumatra (Banju asin near Palembang!).

The type seen in the Museum of Bern. It is not in a fine state, so that several characters are doubtful, e.g. the number of finrays.

2. **Taenioides** Lacépède

(Lacépède, Hist. Nat. Poissons, 2, 1798, p. 580 or 4, 1800, p. 339)

?*Gymnurus* Rafinesque, Analyse de la Nature 1815, p. 84.
Amblyopus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 157.
Leme De Vis, Proc. Linn. Soc. N.S. Wales 8, 1883, p. 286.

Body very elongate, compressed, covered with very rudimentary scales, or naked. Head subcylindrical, naked? Eyes reduced, hidden. Mouth almost vertical, lower jaw prominent. Lips laterally fringed. Teeth in both jaws truncate to obtusely pointed, placed in a band of several rows; an outer row is separated, widely set, enlarged, more or les caninoid. Tongue rounded. Gillopenings not very wide, isthmus as broad as the base of ventral fin. Inner edge of shouldergirdle without fleshy flaps. Several ridges of papillae on head, radiating from eye, on cheek, opercle and on mandible. Some barbels on ventral side of the head. Dorsal fins continuous, with 5-6 simple rays and 38-50 branched rays. Anal fin with 45-49 rays. Both fins are more or less connected with the caudal fin. Ventral fins large, united, oblong. Pectoral fin small. Caudal fin oblong.

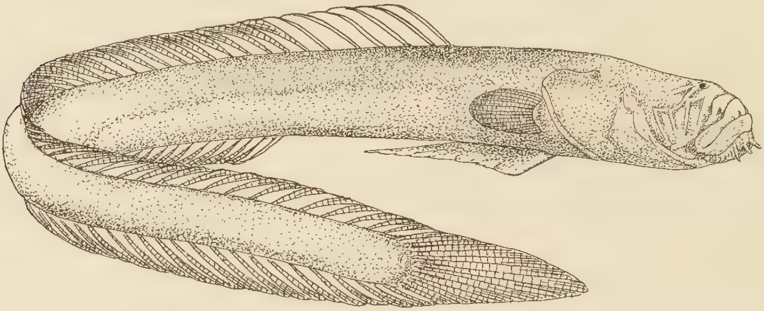

Fig. 67. *Taenioides cirratus* (Blyth). × $^8/_9$.

Distribution: East coast of Africa to the Pacific.

Key to the Indo-Australian species of Taenioides

1. Length of head shorter than distance from base of ventral fin to vent.
   A. Teeth in upper jaw about 5 on each side, in lower jaw about 4 . . . . 1. *T. cirratus* p. 270.
   B. Teeth in upper jaw 7 on each side, in lower jaw 3-4 . . . . 2. *T. eruptionis* p. 272.
2. Length of head longer than distance from base of ventral fin to vent.
   A. Height of body 10-10½ in length, about 11½ in total leagth. In upper jaw on each side 4-5 canines of outer row. Dorsal, anal and caudal fins black . . . . 3. *T. buchanani* p. 272.
   B. Height of body 13-15 in length. In upper jaw on each side about 7 canines. Scales absent . . . . 4. *T. anguillaris* p. 273.

1. **Taenioides cirratus** (Blyth) (Fig. 67, p. 270)

Amblyopus gracilis Bleeker, Verh. Bat. Gen. 22, 1849, p. 38 (not of C. V.?).
Amblyopus cirratus Blyth, Journ. Asiat. Soc. Bengal 29, 1860, p. 147.
Amblyopus brachygaster Günther, Cat. Fishes 3, 1861, p. 134.

Gobioides cirratus Day, Fishes India 1878, p. 318, pl. 69 fig. 4. — Fauna Brit. India Fishes 2, 1889, p. 300.

?*Leme mordax* De Vis, Proc. Linn. Soc. N.S. Wales 8, 1883, p. 286.

Taenioides caeculus M. Weber, Siboga Exp. Fische 1913, p. 486 (not of Bl. Schn.)

?*Leme mordax* McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 205, pl. 31 fig. 4.

?*Taenioides cirratus* Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 333.

?*Gobioides cirratus* Hardenberg, Treubia 13, 1931, p. 144. — Nat. Tijdschr. Ned. Indië 95, 1935, p. 238.

Taenioides gracilis cirratus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 103, fig. 44 (pro parte?).

Taenioioides cirratus Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 181, fig. 28.

Leme mordax Koumans, Zool. Meded. Leiden 22, 1940, pp. 159, 174 (as probable synonym).

Taenioides cirratus Koumans, Mem. Indian Mus. 13, 1941, p. 301.

D. VI. 43-49; A. I. 42-47; P. 13.

Body subcylindrical anteriorly, compressed posteriorly, height about 11-14 in length, about 12-16 in total length. Head about $6^1/_2$-$7^1/_2$ in length, about $7^3/_4$-9 in total length, a little shorter than the distance from base of ventral fin to vent. Teeth strong, on each side about 5 in outer row in upper jaw, about 4 on each side in lower jaw; behind these outer rows a band of small teeth. A row of 3 short barbels on each side of chin. Dorsal and anal fins separated from the caudal fin by a deep notch. Caudal fin rhomboid. Pectoral fin short, about 3 in head. Colour in spirits uniform grayish. Length 300 mm.

Habitat: ?Sumatra (Bagan Si Api Api); Java (Surabaja!); Molo Strait!; Borneo (Sarawak, ?Samarinda); Misol; New Guinea (Andai!). — Zanzibar, India!, Andamans!, ?Philippines, ?Japan, ?Australia!.

Type of *Amblyopus brachygaster* seen in British Museum (N.H.), specimens of *Leme mordax* seen in Australian Museum, Sydney and Queensland Museum, Brisbane, specimens of Bleeker's collection of *Amblyopus gracilis* seen in the Leiden Museum.

Note: Bleeker has placed the name *Amblyopus gracilis* with an ? to his specimens. Probably *A. gracilis* C.V. is distinct from *Taenioides cirratus*.

Probably *Amblyopus sumatranus* Volz, Zool. Anz. 26, 1903, p. 554 and Zool. Jahrb. Syst. 19 Heft 4, 1903, p. 364, belongs to this species. The characters are as follows:

D. VI. 48; A. 44-46. Height 12 in total length (7 in length, about 9 in total length). Head 6 in total length (5 in length), equal to distance from base of ventral fin to vent. In upper jaw 4 larger teeth, in lower jaw 8, between them a number of small teeth (small teeth in upper jaw in 2? rows). Pectoral fin $^1/_2$ of head ($^2/_3$ of head, as long as ventral fin). Dorsal and anal fins not continuous with caudal fin. Caudal fin pointed. An unpaired barbel at symphysis of lower jaw. Body naked. Colour reddish. Length 90 mm. Habitat: Banju asin, Sumatra.

In examining the two type specimens of 9 cm, which are preserved in formol in the Museum at Bern, I found some data, which are placed in parentheses. The specimens are badly preserved.

2. **Taenioides eruptionis** (Blkr.)

Amblyopus eruptionis Bleeker, Verh. Bat. Gen. 22, 1849, p. 38.

D. VI. 50; A. I. 48; P. 16.

Body elongate, compressed, height 15-24 in total length. Head obtuse, a little compressed, 10-12 in total length. Head less than the distance from ventral fin to vent. Teeth in several rows, outer row enlarged. In upper jaw on each side 7, in lower jaw on each side 3-4 teeth in outer row. Bases of dorsal and anal fins connected with the caudal fin. Colour of body and fins greenish, belly lighter. Length 340 mm.

Habitat: Java (Kalimas or Kali Kediri at Surabaia!); Ambon.

Specimen of Bleeker's collection seen in the Leiden Museum. This only specimen is so badly preserved, that only could be decided that it is a *Taenioides*. *T. eruptionis* is closely allied to *T. cirratus* (Blyth), perhaps identical.

3. **Taenioides buchanani** (Day)

Amblyopus Buchanani Day, Proc. Zool. Soc. London 1873, p. 110.
Gobioides Buchanani Day, Fishes India 1878, p. 318, pl. 67 fig. 5. — Fauna Brit. India Fishes 2, 1889, p. 300.
Taenioides buchanani Koumans, Mem. Indian Mus. 13, 1941, p. 301.

D. VI. 42; A. I. 35; P. 19.

Body subcylindrical anteriorly, compressed posteriorly, height about 10 in length, about $11^1/_2$ in total length. Head about 6 in length, 7-$7^1/_2$ in total length, $1^3/_4$ in distance from base of ventral fin to vent. Teeth on each side 4-5 canines of outer row in upper jaw, in lower jaw on each side 5 canines; behind these outer rows a band of small teeth. A pair of canines at symphysis of lower jaw. A row of 3 barbels on each side below head, the first ones close together at the chin. Dorsal and anal fins continuous with caudal fin. Caudal fin pointed. Pectoral fin short, about 3 in head. Colour brownish olive above, reddish below. Vertical fins black. Length 300 mm.

Habitat: ?Sumatra (Bagan Si Api Api!) — India!.

Specimens from Day's collection seen in the Indian Museum, Calcutta and in the Leiden Museum.

Note: With some hesitation I bring 9 specimens of the Amsterdam Museum from Bagan Si Api Api to this species, as they show some differences. Height of body ± 10-11 in length. The vertical fins are not totally black and the dorsal fin shows VI. ± 48. Head about 2 in distance from base of ventral fin to vent. Pectoral fin a little longer than described.

4. **Taenioides anguillaris** (L.)

Gobius anguillaris Linnaeus, Syst. Nat. ed. 10, 1758, p. 264.
?*Taenioides Hermannii* Lacépède, Hist. Nat. Poissons 4, 1800, p. 339, pl. 6. fig. 1.
Gobioides anguilliformis Lacépède, o.c. p. 398.
Cepola coecula Bloch ed. Schneider, Syst. Ichth. 1801, p. 241, pl. 54.
?*Taenioides Hermanni* Bloch ed. Schneider, o.c. p. 564.
Amblyopus caeculus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837. p. 165 [1]).
Amblyopus hermannianus Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1172 (not of C.V.).
Amblyopus caeculus Günther, Cat. Fishes 3, 1861, p. 133.
Taenioides anguillaris Bleeker, Arch. neerl. sc. ex. et nat. 13, 1878, p. 54.
Gobioides anguillaris Day, Fishes India 1878, p. 317, pl. 67 fig. 4. — Fauna Brit. India Fishes 2, 1889, p. 299, fig. 99.
Gobioides caeculus Day, Fishes India 1878, p. 318, pl. 68 fig. 1. — Fauna Brit. India Fishes 2, 1889, p. 299.
Taenioides caeculus Chabanaud, Bull. Soc. Zoöl. de France 52, 1927, p. 406, fig.
?*Taenioides caeculus* Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 331.
?*Taenioides hermannii* Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 419.

---

1) According to Lönnberg, Beh. Svenska Ak. 22 no. 1, 1896, p. 41, the type specimen of *Gobius anguillaris* Linnaeus belongs to *Amblyopus caeculus* C.V.

?*Gobioides anguillaris* Hardenberg, Treubia 13, 1931, p. 142.
Taenioides anguillaris Koumans, Mem. Indian Mus. 13, 1941, p. 302.

D. VI. 40-47; A. I. 37-44; P. 15.

Body subcylindrical anteriorly, compressed posteriorly, height 13-15 in length, 14-18 in total length. Head $6^1/_2$-$7^1/_2$ in length, about $8^1/_2$ in total length, $1^1/_2$-$1^2/_3$ in distance from base of ventral fin to vent. Teeth on each side about 7 canines in outer row in upper jaw, in lower jaw on each side 4-5 canines; behind these outer rows a band of smaller teeth. A pair of canines may be present behind symphysis of lower jaw. A row of 3 short barbels on each side below head. Dorsal, anal and caudal fins continuous. Caudal fin pointed. Pectoral fin short, about 3 in head. Colour pinkish. The caudal fin is darker in its centre. Length 310 mm.

Habitat: ?Sumatra (Bagan Si Api Api); Java (Djakarta harbour!); Strait Makassar!; New Guinea (Doreh!). — India!, Andamans, Penang!, China. — In estuaries in mud.

Types of *Amblyopus caeculus* C.V. seen in Paris Museum, type of *A. hermannianus* Cantor seen in British Museum (N.H.).

3. **Odontamblyopus** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 330)

Psilosomus Swainson, Nat. Hist. Class. Fishes 2, 1839, pp. 183, 279.
Cayennia Sauvage, Bull. Soc. Philom. Paris (7) 4, 1880, p. 57.
Sericagobioides Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 335.

Body very elongate, compressed, covered with many minute, more or less rudimentary scales. Head compressed, nearly totally scaled with minute rudimentary scales. Eyes very small, near dorsal profile of head. Bony interorbital and snout about 2 eyediameters. Mouth oblique, lower jaw prominent. Teeth in upper jaw in 2 rows, in lower jaw anteriorly 3 rows, laterally 2 rows. The outer row in both jaws is strongly enlarged, widely set, forming on each side about 4 recurved canines. In lower jaw on each side of symphysis a canine. Tongue truncate. Gillopenings wide, isthmus narrow, as broad as the base of ventral fin. Inner edge of shouldergirdle without fleshy flaps. Two rows of barbels on head. Dorsal fins continuous, with 6 simple rays and 34-40 branched rays. Anal fin with 33-38 rays. Both fins are connected with their bases to the caudal fin. Ventral fins united, oblong. Pectoral fin about as long as ventral fin. Caudal fin pointed, long.

Distribution: India to Japan, Indo-Australian Archipelago.

1. **Odontamblyopus rubicundus** (H. B.) (Fig. 68, p. 275)

Gobioides rubicundus Hamilton Buchanan, Gangetic Fishes 1822, pp. 37, 365, pl. 5 fig. 9.
Amblyopus hermannianus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 159, pl. 350.
Amblyopus mayenna Cuvier & Valenciennes, o.c. p. 163.
Amblyopus hermannianus Günther, Cat. Fishes 3, 1861, p. 135.
?*Amblyopus taenia* Günther, o.c. p. 135.
Gobioides rubicundus Day, Fishes India 1878, p. 319, pl. 67 fig. 6. — Fauna Brit. India Fishes 2, 1889, p. 301.
Amblyopus rubicundus Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova 29 (2a Ser. 9), 1890, p. 177.
Taenioides abbotti Jordan & Starks, Proc. U.S. Nat. Mus. 31, (1907) 1906, p. 524, fig. 4.
?*Taenioides* spec. juv. M. Weber, Siboga Exp. Fische 1913, p. 487 [1]).
Amblyopus rubicundus Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova 50 (3a Ser. 10), 1926, p. 554.
Gobioides rubicundus Hardenberg, Treubia 13, 1931, p. 145.
Taenioides rubicundus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 102, fig. 43 (pro parte?).
Taenioides abbotti Koumans, Zool. Meded. Leiden 22, 1940, pp. 131, 146 (as synonym).
Odontamblyopus rubicundus Koumans, Mem. Indian Mus. 13, 1941, p. 304.

D. VI. 35-40; A. I. 32-39; P. 30.

Body compressed, height 8-13$^1/_2$ in length, 10-14 in total length. Head subcylindrical, obtuse, convex, 5$^1/_3$-6$^3/_4$ in length, 7$^1/_2$-8 in

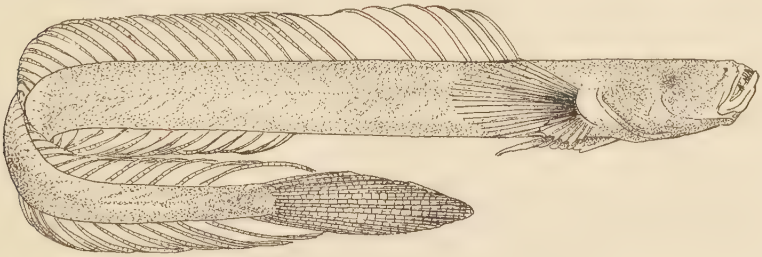

Fig. 68. *Odontamblyopus rubicundus* (H.B.) n.s.

---

1) The specimens stated by M. Weber from Djankar and Strait Molo, probably belong to this species.

total length, $1^{1}/_{4}$-$1^{2}/_{3}$ in distance from base of ventral fin to vent. Mouth oblique, lower jaw prominent. Maxillary extends to beyond eye. Teeth in upper jaw on each side 4 canines of outer row, in lower jaw on each side 4-6 canines. A pair of canines behind symphysis of lower jaw. On each side a row of about 3 barbels on lower side of head, sometimes indistinct. Scales minute, only visible with a lens. Dorsal and anal fins separated from caudal fin by a deep notch. Pectoral fin about as long as ventral fin, about $1^{1}/_{2}$ in head. Caudal fin pointed, much longer than head, $4^{1}/_{2}$-$5^{1}/_{2}$ in total length. Colour green to red above, red to whitish below. Fins green to red. Caudal fin violet posteriorly. Length 220 mm.

Habitat: Singapore; Sumatra (Palembang, Bagan Si Api Api!); Java (Surabaja, ?Djankar!); ?Strait Molo!; Borneo (Sarawak, Sadang); Ambon. — India!, West coast of Malaya (Tandjong Londang!), Port Arthur!, ?Japan.

Type of *Amblyopus taenia* seen in British Museum (N.H.) of *Taeniodes abbotti* the type seen in U.S. Nat. Mus., cotype in Stanford University.

Note: The type specimen of *Amblyopus taenia* Gthr. differs from *O. rubicundus* in having the height of body 15 in length, 18 in total length. Head 8 in length, 10 in total length. The finformula is D. VI. 34; A. I. 32. The type specimen is 270 mm and came from India.

2. Subfamily TRYPAUCHENINAE

Body very elongate, eel-like. At the upper margin of opercle a pit, opening to a cavity, which is separate from the gillcavity. Eyes small, rudimentary.

Key to the Indo-Australian genera of Trypaucheninae

A. Ventral fins completely united, forming a funnel-shaped disk. . . . . 1. *Trypauchen* p. 277.
B. Ventral fins not completely united, either emarginate posteriorly or separated to base.
  a. Ventral fins separated to the base, teeth like in Trypauchen .. . . 2. *Trypauchenichthys* p. 280.
  b. Ventral fins united, but emarginate posteriorly. Canines absent . . . . . 3. *Ctenotrypauchen* p. 281.

1. **Trypauchen** Cuvier & Valenciennes

(Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 152)

Body very elongate, compressed, covered with about 100 cycloid scales. Head compressed, naked, with a median crest on occiput. Eyes small, bony interorbital and snout about 2 eyediameters. Mouth very oblique, lower jaw prominent. Teeth in both jaws in 2-3 rows, the outer one strongly enlarged, caninoid. Tongue rounded. Gillopenings not very wide, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. At the upper margin of opercle a pit, which opens to a cavity, which is separate from the gillcavity. No barbels on head. Dorsal fins continuous, with 6 simple rays and 41-49 branched rays. Anal fin with 40-46 rays. Both fins connected with the caudal fin. Ventral fin very small, with one simple and 5 branched rays on each side. Pectoral fin small. Caudal fin pointed.

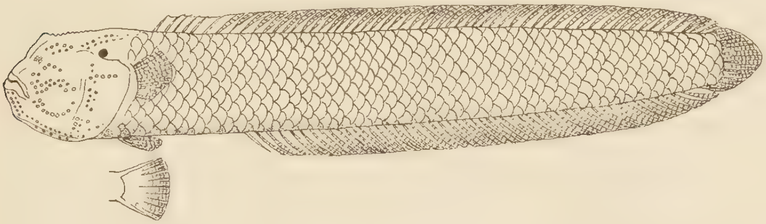

Fig. 69. *Trypauchen taenia* nov. spec. n.s.

Distribution: From Persian Gulf to Japan, Indo-Australian Archipelago.

Key to the Indo-Australian species of Trypauchen

A. L.l. 80-115; L.tr. 21 . . . . 1. *T. vagina* p. 277.
B. L.l. 65; L.tr. 14 . . . . 2. *T. raha* p. 279.
C L.l. 45-50; L.tr. 14 . . . . 3. *T. taenia* p. 279.

1. **Trypauchen vagina** (Bl. Schn.)

Gobius vagina Bloch ed. Schneider, Syst. Ichth. 1801, p. 73.
Gobioides ruber Hamilton Buchanan, Gangetic Fishes 1822, pp. 33, 365.
Trypauchen vagina Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 153.
Trypauchen vagina Bleeker, Verh. Bat. Gen. 22, 1849, p. 37.

Trypauchen vagina Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1172.
Gobioides ruber Cantor, o.c. p. 1172.
Trypauchen vagina Bleeker, Act. Soc. Reg. Ind. Neerl. 8, 1860, p. 60.
Trypauchen vagina Day, Fishes India 1878, p. 320, pl. 68 fig. 2. — Fauna Brit. India Fishes 2, 1889, p. 302, fig. 100.
Trypauchen vagina M. Weber, Siboga Exp. Fische 1913, p. 487 (pro parte) [1]).
Trypauchen vagina Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 338, pl. 26 fig. 3.
Gobioides ruber Hora, Mem. Indian Mus. 9 no. 4, 1929, pl. 18 fig. 2 (M.S. drawing of H.B.).
Trypauchen vagina Wu. Contr. Biol. Lab. Sci. Soc. China 7 Zool. Ser., 1931, p. 52.
Trypauchen vagina vagina Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 104.
Trypauchen vagina Koumans in Blegvad & Løppenthin, Danish Sci. Invest. Iran prt 3, 1944, p. 173, fig. 102.
Trypauchen vagina Koumans, Mem. Indian Mus. 13, 1941, p. 305.

D. VI. 40-49; A. I. 39-46; P. 15-18; L.l. 80-115; L.tr. 21.

Body compressed, height 9-10 in length, 11$^1/_2$ in total length. Head obtuse, compressed, 6$^1/_2$ in length, 6$^3/_5$-7$^1/_4$ in total length. Eyes very small, covered by skin. Mouth very oblique, lower jaw prominent. Chin very convex. Maxillary extends to behind eye. Teeth in many rows, pointed. Outer row enlarged, caninoid. Head, nape and breast naked. Scales of body cycloid. Dorsal fins continuous, not emarginate between the two parts. Rays of first dorsal fin very feeble, $^1/_3$ of depth of body, the sixth far away from the fifth. Pectoral fin $^1/_2$ of head, the undermost 5 rays are much shorter, but branched. Ventral fin 2$^1/_2$-3 in head, disk not emarginate posteriorly. Caudal fin rounded, about as long as head. Colour reddish. Length 222 mm.

Nom. indig.: Djadjan aprit (Mal. Djakarta).

Habitat: Singapore (Pulu Weh!; Bintang (Rio); Sumatra (Priaman, Bagan Si Api Api); Java (Djakarta!, Tjilatjap, Surabaja!, Banjuwangi); Strait Madura!; Madura! (Kammal); West Bali; Lombok (Labuan Tring!); ?Flores!; Borneo (Sampit, Sinkawang, Sarawak); Celebes (Makassar!, Malawa, Badjoa); Ceram; Ambon. — Persian Gulf!, India!, Nicobars, Penang, Siam!, Indo China, China (Amoy!, Foochow!), Formosa. — In sea and estuaries.

---

1) The specimens from Kwandang, North Celebes and Saleyer belong to *Ctenotrypauchen microcephalus* (Blkr.).

2. **Trypauchen raha** Popta

Trypauchen raha Popta, Zool. Meded. Leiden 7, 1922, p. 37.

D. VI. 46; A. I. 42; P. 15; L.l. 65; L.tr. 14.

Body elongate, compressed, height $8^3/_{13}$ in length, $9^7/_{13}$ in total length. Head obtuse, compressed, $6^5/_{17}$ in length, $7^5/_{17}$ in total length. Eye very small, interorbital convex. A crest medially on nape behind eye. Snout $3^7/_9$ in head. Mouth curved. Maxillary does not reach to below posterior margin of eye. Lower jaw prominent, chin convex. Teeth in 2 rows, outer row unequal, but no real canines. Head naked without pores, but with some rows of mucous canals. Nape naked, breast and belly naked. Scales of body cycloid. Insertion of dorsal fin a little behind base of pectoral fin. Dorsal fin and anal fin continuous with caudal fin. Caudal fin as long as head, pointed. Pectoral fin short, concave, with the upper rays much longer than the lower rays. Ventral fin rounded, not emarginate posteriorly. Colour in spirits yellowish. Length 124 mm.

Habitat: Muna (Raha).

After Popta, not seen by us.

3. **Trypauchen taenia** nov. spec. (Fig. 69, p. 277)

D. VI. 48-49; A. I. 40-44; P. 15; L.l. 45-50; L.tr. 11.

Body elongate, compressed, height $6^1/_2$ in length, $7^1/_2$ in total length. Head obtuse, compressed, $5^3/_4$ in length, $6^1/_2$ in total length. Eyes very small, interorbital convex. A sharp denticulated crest behind eye medially on nape. Soout $3^3/_4$ in head. Mouth curved. Maxillary does not reach to below posterior margin of eye. Lower jaw prominent. Chin convex. Teeth in some rows, outer two rows enlarged, outer row more or less caninoid. Head naked, pores as in *T. vagina*. Nape naked, breast naked, belly scaled, but naked in the median line. Scales of body cycloid. Dorsal fin continuous with caudal fin, inserted a little behind base of pectoral fin. Anal fin continuous with caudal fin. Caudal fin as long as head, rounded. Pectoral fin short, the undermost 5 rays are much shorter than the upper rays. Ventral fin rounded, not emarginate posteriorly. Colour in spirits yellowish brown. Length 110 mm.

Habitat: Sumatra!.

Note: I found two specimens of 105 and 110 mm from Sumatra, collected by S. Müller, in the collection of the Leiden Museum, no. 1950, with a label *Trypauchen taenia* n.sp. This name has never been published.

2. **Trypauchenichthys** Bleeker

(Bleeker, Act. Soc. Indo-Neerl. 8, 1860, p. 63)

Body very elongate, compressed, covered with 38-55 cycloid scales. Head compressed, naked, with a median crest on occiput. Eyes small, bony interorbital and snout about 2 eyediameters. Mouth very oblique, lower jaw prominent. Teeth in both jaws in 2 rows, the outer one enlarged, anterior teeth caninoid. Tongue rounded. Gillopenings not very wide, isthmus broad. Inner edge of shouldergirdle without fleshy flaps. At the upper margin of opercle a pit which opens to a cavity, which is separate from the gillcavity. No barbels on head. Dorsal fins continuous, with 5 or 6 simple rays and 37-59 branched rays. Anal fin with 35-52 rays. Both fins are more or less connected with the caudal fin. Ventral fins separate, with each 1 simple and 3 branched rays, the third ray very small. Pectoral fin small. Caudal fin oblong.

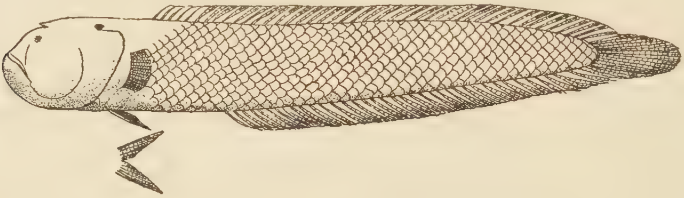

Fig. 70. *Trypauchenichthys sumatrensis* Hardenberg. × 2.

Distribution: India, Indo-Australian Archipelago, Philippines.

Key to the Indo-Australian species of Trypauchenichthys

1. D. V. 37-41; A. I. 34-38; L.l. 38-40. . . . . 1. *T. sumatrensis* p. 280.
2. D. VI. 56-59; A. I. 49-51; L.l. 50-55. . . . . 2. *T. typus* p. 281.

1. **Trypauchenichthys sumatrensis** Hardenberg (Fig. 70, p. 280)

Trypauchenichthys sumatrensis Hardenberg, Treubia 13, 1931, pp. 146, 417, fig. 7.

Trypauchenichthys sumatrensis Koumans, Mem. Indian Mus. 13, 1941, p. 306.

D. V. 37-41; A. I. 34-38; P. 15; L.l. 38-40.

Body compressed, height 6.3-7.1 in length. Head obtuse, compressed, 5-5.3 in length. Eyes very small. Mouth very oblique, curved. Head naked. On head a rather elevated crest, faintly serrated and pointed in front. Some open pores on head. Dorsal fins continuous with caudal fin and anal fin. Lower rays of pectoral fin much shorter than the upper rays. Ventral fin without basal membrane, totally separate. Caudal fin oblong, about 6 in total length. Colour uniform pink. Fins in fresh specimens somewhat blackish. Length 65 mm.

Habitat: Sumatra (Bagan Si Api Api!). — India (sandheads in mouth of river Hooghly!).

Type seen in the Laboratorium voor het Onderzoek der Zee, Batavia.

2. **Trypauchenichthys typus** Blkr.

Trypauchenichthys typus Bleeker, Act. Soc. Indo-Neerl. 8, 1860, p. 63.
Trypauchenichthys typus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 340.
Trypauchenichthys typus Koumans, Mem. Indian Mus. 13, 1941, p. 307.

D. VI. 56-59; A. I. 49-51; P. 18; L.l. ± 50-55.

Body compressed, height 9 in length, 10-$10^1/_2$ in total length. Head obtuse, compressed, $6^1/_4$ in length, $7^2/_5$-$7^3/_5$ in total length. Eyes very small, covered by skin. Snout 4 in head. Mouth very oblique, curved. Lower jaw prominent. Maxillary 3 in head. Teeth of outer row enlarged. Head, nape, breast and belly naked. Scales of body cycloid. Dorsal fin emarginate between the two parts. Pectoral fin pointed, $^1/_2$ of head, lower rays shorter. Ventral fins without basal membrane, totally separated, $^1/_2$ of head. Caudal fin rounded, 7 in total length. Colour red. Fins reddish hyaline. Length 180 mm.

Habitat: Riouw Archipelago (Amphitrite bay near Indragiri!); Borneo (Sungi duri!, Kumai river!, Matang, Sarawak). — Philippines (Cagayan Island).

Types seen in the Leiden Museum.

3. **Ctenotrypauchen** Steindachner

(Steindachner, Sitz. ber. Ak. Wiss. Wien 55, 1867, p. 530)

Body very elongate, compressed, covered with about 65 cycloid scales. Head compressed, with a median crest on occiput. Mouth very oblique, lower jaw prominent. Teeth of outer row enlarged, but no canines. At the upper margin of opercle a pit which opens to a cavity, which is separate from the gillcavity. No barbels on head. Dorsal fins continuous, with 6 simple rays and about 50 branched rays. Anal fin with 44-49 rays. Both fins connected with the caudal fin. Ventral fins united, but deeply emarginate, basal membrane present. Pectoral fin small. Caudal fin rounded to pointed.

Habitat: From coast of Natal and Persian Gulf to Japan and Indo-Australian Archipelago.

1. **Ctenotrypauchen microcephalus** (Blkr.) (Fig. 71, p. 282)

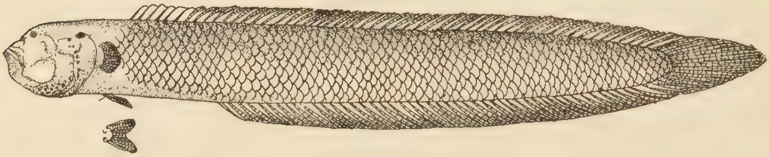

Fig. 71. *Ctenotrypauchen microcephalus* (Blkr.) n.s.

Trypauchen microcephalus Bleeker, Act. Soc. Indo-Neerl. 8, 1860, p. 62.
Trypauchen vagina M. Weber, Siboga Exp. Fische 1913, p. 487 (pro parte).
Trypauchenichthys typus Hora, Rec. Indian Mus. 26 pt. 2, 1924, p. 159, figs. 1d, 4b (not of Blkr.).
Trypauchenichthys typus Hora, Mem. Asiat. Soc. Bengal 6, 1924, p. 497 (not of Blkr.).
Ctenotrypauchen microcephalus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 341.
Trypauchen microcephalus Hardenberg, Treubia 13, 1931, pp. 145, 417, fig. 6.
?*Trypauchen vagina microcephalus* Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 104 (not of Blkr., or only pro parte).
Ctenotrypauchen microcephalus Koumans, Mem. Indian Mus. 13, 1941, p. 307.

D. VI. 50; A. I. 44-49; P. 17; L.l. ± 65.

Body compressed, height 8 in length, $8^3/_4$ in total length. Head obtuse, compressed, 7 in length, $8^1/_2$ in total length. Eyes very small, covered by skin. Snout 4 in head. Mouth very oblique, lower jaw prominent. Maxillary 3 in head. Teeth in outer row enlarged, no canines. Head, nape, breast and belly naked. Scales of body cycloid. Dorsal fins continuous. Pectoral fin $^1/_3$ of head, lower rays shorter. Ventral fins $4^1/_2$ in head, united, but deeply emarginate, basal membrane present. Caudal fin rounded, $7^{1}/_{4}$ in total length. Colour red. Fins reddish hyaline. Length 180 mm.

Habitat: Singapore!; Sumatra (Seneboei near Bagan Si Api Api!, Banjuasin!); Java (Surabaja!); Borneo (Sungi duri!); Celebes (Kwandang!); Saleyer!. — Persian Gulf!, India!, Andamans!, Siam (Singgora Tale Sap!), Philippines (Negros). — In estuaries.

Type seen in the Leiden Museum.

3. Family ELEOTRIDAE

Gobioidea with separated ventral fins. Two dorsal fins, separated or connected with their bases. Body scaled with ctenoid or cycloid scales, sometimes partly or totally naked.

Distribution: All over the world, but especially in the temperate and tropical regions in freshwater, estuaries and sea.

Key to the Indo-Australian genera of Eleotridae

I. Teeth on vomer present. Head scaled. Scales small, cycloid, 100 or more in L.l.	1. *Bostrichthys* p. 285.
II. No teeth on vomer.	
A. Margin of preopercle with 1-6 spines, directed backwards. Head compressed . . .	2. *Asterropteryx* p. 289.
B. A single, downwards curved, strong spine at angle of preopercle. Head subcylindrical to depressed	3. *Eleotris* p. 292.
C. Preopercle without spine.	
a. Bony crests in interorbital space.	
a'. Crests on head feeble. About 40 scales in L.l.	4. *Odontobutis* p. 302.
b'. Crest on head well developed. About 30 scales in L.l.	
aa. Head flat, pointed, lower jaw prominent	5. *Butis* p. 304.
bb. Head short, obtuse, jaws subequal.	6. *Prionobutis* p. 312.
b. No bony crests on head.	
a'. First dorsal fin with 6 rays.	
aa. Second dorsal fin with less than 20 rays.	
1. Ventral fins long, narrow, rays fringed. L.l. 22-28	7. *Eviota* p. 316.
2. Head with barbels. L.l. 54, intermixed with smaller scales D. 2 I. 11-12	8. *Pogoneleotris* p. 323.

3. Body short, high, compressed. L.l. 23-32. . . . . 9. *Hypseleotris* p. 324.
4. Ventral fins normal, no barbels, body not high.
    - α. Head scaled, totally or partly.
        - α′. Scales of body cycloid. In upper jaw 2-4 canines in front. Body cylindrical . . 10. *Odonteleotris* p. 329.
        - β′. Scales of body, at least posteriorly, ctenoid.
            - A. Body very elongate, compressed, head compressed.
                - *a.* Teeth in upper jaw in one row . . . . . . 11. *Eleotriodes* p. 332.
                - *b.* Teeth in upper jaw in 3-4 rows . . . . . 12. *Amblyeleotris* p. 341.
            - B. Body not very elongate, posteriorly compressed, anteriorly cylindrical. Head not compressed.
                - *a.* Scales in L.l. 28-40 . 13. *Ophiocara* p. 342.
                - *b.* Scales in L.l. more than 40.
                    - *a′.* Teeth in upper jaw not, or hardly enlarged. L.l. 60-70. 14. *Bunaka* p. 349.
                    - *b′.* Teeth of outer row enlarged. L.l. 45-100 . . . . 15. *Oxyeleotris* p. 352.
    - β. Head naked. L.l. 70. First, or first and second branchiostegal end anteriorly in a spine. D. 2. I. 7 . . . . 16. *Belobranchus* p. 361.
    - γ. Head naked. L.l. 100. D. 2 I. 16. 17. *Parioglossus* p. 363.

bb. Second dorsal fin with more than 20 rays.
- α. Chin with one or more barbels. D. 2 I. 24-26. A. 24. . . . . 18. *Vireosa* p. 364.
- β. Chin without barbel.
    1. D. 2 I. 27-30; A. I. 26-30. Scales cycloid. Teeth in several rows. Caudal fin truncate to emarginate. V. I. 4. . . . . . 19. *Ptereleotris* p. 367.
    2. D. 2 I. 28; A. I. 24. Scales ctenoid. Teeth uniserial. Caudal fin pointed. First ray of first dorsal fin prolonged into a long filament. V. I. 5 . . . . . . 20. *Nemateleotris* p. 369.
    3. D. 2 I. 29; A. I. 29. Scales ctenoid. Caudal fin rounded. V. I. 4. . . . . 21. *Orthostomus* p. 370.

4. D. 2 I. 31; A. I. 31. Scales ctenoid. Caudal fin lanceolate. V. I. 4 . . . . 22. *Oxymetopon* p. 372.

b'. First dorsal fin with 7-9 rays. D. 2 I. 13-15. L.l. 38-48. . . . . 23. *Mogurnda* p. 373.

1. **Bostrichthys** Duméril

(Duméril, Zool. Analyt. 1806, p. 120)

Bostrychus Lacépède, Hist. Nat. Poissons 5, 1801, p. 183, or 3, 1802, p. 140 (preoccupied).
Bostrictis Rafinesque, Analyse 1815, p. 84.
Ictiopogon Rafinesque, o.c. p. 91.
Bostrychichthys L. Agassiz, Nomen. Zool. Index. Univ. 1846.

Body elongate, anteriorly cylindrical, posteriorly compressed, covered with more than 100 cycloid scales. Head depressed, scaled.

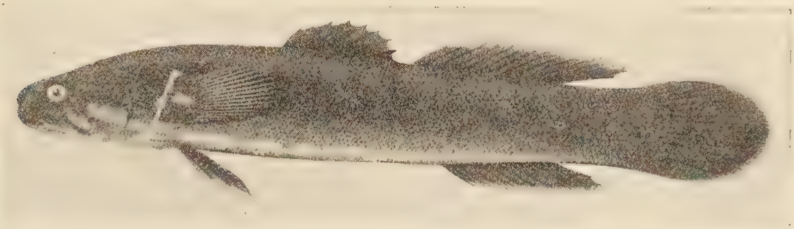

Fig. 72. *Bostrichthys aruensis* (M. Weber). After M. Weber

Teeth small, in several rows, no canines. A patch of teeth in vomer, no teeth in palatines and in tongue. Gillopenings not continued forward below, isthmus broad. Dorsal fins separate. First dorsal fin with 6 to 10 rays. D. 2 I. 9-17; A. I. 8-12.

Distribution: From India to Pacific Ocean, north to China and Riu Kiu Islands.

Key to the Indo-Australian species of Bostrichthys

A. D. 1 VI; D. 2 I. 9-13.
   a. Body without contrasted dark and white parts, only some spots and transverse bands. 1. *B. sinensis* p. 286.
   b. Lower part of body contrasting white. Head with 3 dark stripes on a white background. 2. *B. strigogenys* p. 287.
B. D. 1 VII-X; D. 2 I. 14-17.

a. D. 1 VII-VIII; D. 2 I. 14-15. Body without transverse bands . . . . 3. *B. aruensis* p. 288.
b. D. 1 IX-X; D. 2 I. 16-17. Body with 8-9 dark transverse bands. . . . . 4. *B. zonatus* p. 288.

1. **Bostrichthys sinensis** (Lac.)

Bostrychus sinensis Lacépède, Hist. Nat. Poissons 5, 1801, p. 183, or 3, 1802, p. 141, pl. 14 fig. 2.
Gobius sinensis Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 94.
Philypnus ocellicauda Richardson, Voy. Sulphur Fishes 1844, pp. 58, 149, pl. 56 figs. 15, 16.
Philypnus sinensis Richardson, Rep. Ichth. Chine in Rep. 15th meet. Brit. Ass. 1845, p. 210.
Philypnus ophicephalus Bleeker, Verh. Bat. Gen. 22, 1849, p. 20.
Eleotris sinensis Günther, Cat. Fishes 3, 1861, p. 127. — Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 189.
Bostrychus sinensis Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 16.
Bostrichthys sinensis Day, Fishes India 1878, p. 309, pl. 65 fig. 4. — Fauna Brit. India Fishes 2, 1889, p. 287, fig. 97.
Bostrichthys sinensis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 43, pl. 3 fig. 3.
Bostrichthys sinensis Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 388.
Eleotris (Bostrychus) sinensis Wu, Sinensia 1 no. 11, 1931, p. 169.
Philypnus sinensis Schmidt, Bull. Ac. Sci. U.R.S.S. 1931, p. 121.
Bostrichthys sinensis Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 43.
Bostrichthys sinensis Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 344.
Bostrichthys sinensis Koumans, Mem. Indian Mus. 13, 1941, p. 309.

D. 1 VI; D. 2 I. 9-10; A. I. 8-9; P. 16-17; L.l. ± 100, L.tr. 30.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 6 in length, $7^{1}/_{2}$-$8^{1}/_{2}$ in total length. Head depressed, $3^{3}/_{4}$ in length, $4^{1}/_{5}$-$4^{1}/_{3}$ in total length. Profile straight, or a little concave. Eye 6 in head, interorbital 2 eyediameters. Snout pointed, about as long as eye, or longer than eye; tip before middle of eye. Anterior nostril near margin of snout, tubular. Lower jaw a little prominent. Maxillary extends to below posterior margin of eye. Teeth of outer row distant, inner row small, mixed with larger teeth. Teeth of vomer conical, placed in a half-oval patch. Tongue rounded. Scales very small. Head scaled. First dorsal fin obtuse, half of height of body. Second dorsal fin higher than the first. Pectoral fin obtuse, about as long as postorbital part of head. Ventral fin a little shorter than, or equal to pectoral fin. Anal fin a little shorter and lower than second dorsal fin. Caudal fin obtusely rounded, shorter than head. Colour green above, yellowish below. Back and sides with oblong spots and violet transverse streaks, which do not reach the belly. Fins yellowish. Dorsal fins and anal fin with longitudinal streaks. Base of caudal fin above with orange ocellus, bordered with black. Pectoral, ventral and caudal fin with dark transverse streaks. Length 111 mm.

Nom. indig.: Koto tjino (Jav.).

Habitat: Singapore; Bintang or Rio; Simalur (Sinabang!); Java (Surabaja!); Borneo (Seminju, Lemukutan!); Celebes (Paré Paré!); Talaud Islands (Beo!); Kei Islands (Ohoinongan on Great Kei); New Guinea. — Andamans!, India, Ceylon, Siam, China!, Hongkong!, Riu Kiu Islands, Formosa, Oualan, Kanathia!, Fiji, Samoa, Queensland! (Lindeman Island). — In sea, estuaries and rivers.

2. **Bostrichthys strigogenys** (Nichols)

Bostrychus strigogenys Nichols, Americ. Mus. Novitates no. 922, 1937, p. 1 fig. 1.
Bostrichthys strigogenys Whitley, Rec. Austral. Mus. 20, 1938, p. 232.
Bostrychus strigogenys Koumans, Zool. Meded. Leiden 22, 1940, p. 123 (examination of type).

D. 1 VI; D. 2 I. 11-13; A. I. 9-10; L.l. ± 100-130; L.tr. ± 35; Predorsal scales ± 60.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 6-7 in length, about 7-8 in total length. Head depressed, $3^1/_2$ in length, $4^1/_5$ in total length. Eye $5^1/_2$ in head, interorbital 2 eyediameters. Snout $1^1/_2$ eyediameter, tip before lower margin of eye. Anterior nostril tubular, near margin of snout. Lower jaw prominent. Maxillary extends to beyond posterior margin of eye. Teeth in broad bands. Teeth on vomer in a triangular patch. Tongue rounded. About 4 mucous canals radiate under eye, two longitudinal ones on cheek. Open pores indistinct. Gillopenings continued forward below, isthmus moderate. Head totally scaled. Scales of body cycloid. First dorsal fin much lower than body. Second dorsal and anal fin about $^1/_2$ of height of body. Pectoral fin rounded, $^1/_2$ of length of head. Ventral fin as long as pectoral fin. Caudal fin rounded, as long as head without snout. Colour dark above and on upper $^2/_3$ of side; from breast to caudal peduncle and on lower part of cheek and opercle contrasting white, meeting the dark part in an irregular line. On head 3 dark stripes, downward and backward, the middle one from below the eye, the lower one from the maxillary. The upper two contrasted against the white background. Fins dark. Ventral fins bordered with pale. Vertical fins with slight pale edges. An imperfect ocellus above on caudal base, a pale mark below it at the lower part of caudal base. On caudal fin two or three faint vertical rows of pale spots. Length 220 mm.

Habitat: New Guinea (Upper Fly river!). — In rivers.

Type seen in the American Museum of Nat. Hist., New York.

3. **Bostrichthys aruensis** (M. Weber) (Fig. 72, p. 285)

Bostrychus aruensis M. Weber, Abh. Senck. Naturf. Ges. 34, 1911, p. 44, pl. 2 fig. 4.

D. 1 VII-VIII; D. 2 I. 14-15; A. I. 10-11; P. 17; L.l. 130-140; L.tr. 45.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-6 in length, 6-7 in total length. Head rounded in front, depressed, flat, $3^1/_2$-4 in length, $4^1/_3$-$4^3/_4$ in total length. Eye 7-10 in head, interorbital flat, $2^1/_2$-4 eyediameters. Snout 2-$2^1/_2$ times eye, tip before middle of eye. Mouth oblique, jaws subequal. Anterior nostril tubular. Maxillary extends to behind eye. Teeth on vomer in a halfround patch. Teeth of outer row distant, inner row of teeth small, mixed with larger teeth. Scales cycloid, on head rudimentary. First dorsal fin obtuse, about $^1/_3$ of height. Second dorsal and anal fin higher than first dorsal fin. Caudal and pectoral fin rounded, shorter than head. Ventral fins a little shorter. Colour dark brown, belly lighter. Fins dark with whitish border, except pectoral and first dorsal fin. On lower side of head light blotches. On upper part of caudal fin an indistinct ocellus. Length 217 mm.

Habitat: Aru Islands (Popdjetur Terangan!, Ngaiguli Terangan!, Central Kobroor!). — In freshwater.

Types seen in the Amsterdam Museum and the Senckenberg Museum, Frankfurt a.M.

4. **Bostrichthys zonatus** (M. Weber)

Bostrychus zonatus M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 259, pl. 12 fig. 1.
Bostrichthys zonatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 389.

D. 1 IX-X; D. 2 I. 16-17; A. I. 12; P. 16; L.l. 120-130; L.tr. 35.

Body cylindrical anteriorly, compressed posteriorly, height $5^1/_4$-

$5^1/_2$ in length, $6^3/_4$ in total length. Head pointed in front, depressed, $3^1/_2$ in length, $4^1/_3$-$4^2/_3$ in total length. Eye $5^1/_2$-$7^1/_2$ in head, interorbital 2 times eye. Snout $1^1/_2$-2 times eye. Jaws equal. Mouth oblique. Maxillary extends to beyond eye. Teeth of outer row distant, inner row of teeth small, mixed with larger teeth. Scales cycloid, on head very small. First dorsal fin is half of height of body. Second dorsal and anal fin higher than first dorsal fin. Caudal fin rounded, much shorter than head. Pectoral and ventral fins shorter than head. Colour dark brown, belly reddish. Eight to nine broad dark transverse bands on body. Between each of these broad bands, which are sometimes split into two ones, there is a narrow transverse stripe. Upper part of caudal fin with ocellus. Dorsal fins, anal and caudal fin dark brown, clouded with light, whitish bordered. Pectoral and ventral fins dark. Length 150 mm.

Habitat: New Guinea (Merauke! river). — In brooks and estuaries.

Types in the Amsterdam Museum.

2. **Asterropteryx** Rüppell

(*Asterropterix* Rüppell, Atl. Reise N. Afrika 1828, p. 138)

Brachyeleotris Bleeker, Versl. Ak. Amsterdam (2) 8, 1874, p. 374.

Body a little elongate, compressed, covered with about 25 ctenoid scales. Head compressed, convex, scaled above behind the eyes, on cheek and opercle. Mouth oblique. Teeth in several rows,

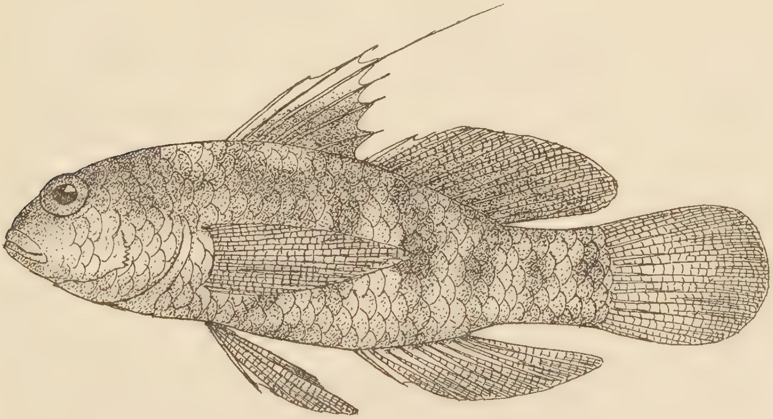

Fig. 73. *Asterropteryx semipunctatus* Rüpp. × 2½.

outer enlarged, in lower jaw a canine on each side. Preopercle with one to six stout spines at the angle; these spines are directed backwards. Gillopenings not continued forward below, isthmus broad. Base of first dorsal fin extends to base of second dorsal fin. First dorsal fin with 6 rays. D. 2 I. 9-11; A. I. 8-11. Caudal fin obtuse, rounded.

Distribution: From Red Sea to the Pacific.

Note: Koumans, Zool. Meded. Leiden 22, 1940 p. 181 states that the bases of the inner rays of ventral fins in the two species of this genus, *A. semipunctatus* and *ensiferus*, are connected by a very short membrane. In preserved specimens this membrane is usually torn.

Key to the Indo-Australian species of Asterropteryx

1. Preopercle with 3-5 short spines at the angle. 1. *A. semipunctatus* p. 290.
2. Preopercle with a single spine, reaching the posterior border of opercle . . . . 2. *A. ensiferus* p. 291.

1. **Asterropteryx semipunctatus** Rüpp. (Fig. 73, p. 290)

Asterropteryx semipunctatus Rüppell, Atl. Reise N. Afr. Fische 1828, pl. 34 fig. 4.
Asterropterix semipunctatus Rüppell, o.c. p. 138.
Asterropteryx semipunctatus Rüppell, Neue Wirbelthiere Fische 1838, pp. 140, 141.
Eleotris cyanostigma Bleeker, Nat. Tijdschr. Ned. Indië 8, 1855, p. 452.
Eleotriodes cyanostigma Bleeker, o.c. 15, 1858, p. 460.
Eleotris cyanostigma Playfair, Proc. Zool. Soc. London 1867, p. 862.
Brachyeleotris cyanostigma Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 84.
Eleotris semipunctata Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 187, pl. 111 fig. D.
Eleotris miniatus Seale, Occ. Pap. B.P. Bishop Mus. 1 no. 3, 1901, p. 125.
Eviota miniata Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 386.
Asterropterix semipunctatus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 273 (see for synonyms).
Asterropteryx semipunctatus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 28, pl. 1 fig. 2.
Asterropterix semipunctatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 394.
Asterropteryx semipunctatus Herre, Field. Mus. Nat. Hist. Zool. 21, 1936, p. 341.
Asterropteryx semipunctatus Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 40, fig. 2.
Asterropteryx albilosus Ogilby in Queensland Museum.

Eleotris miniatus Koumans, Zool. Meded. Leiden 22, 1940, p. 156 (as synonym).
Asterropteryx albilosus Koumans, o.c. p. 156 (as synonym).
Asterropteryx semipunctatus Koumans, Mem. Indian Mus. 13, 1941, p. 310.

D. 1 VI; D. 2 I. 9-11; A. I. 8-10; P. 17; L.l. 24; L.tr. 8; Predorsal scales 7.

Body rather high, compressed, height about $3\text{-}3^1/_2$ in length, $4^1/_2$ in total length. Head compressed, $3^1/_2$ in length. Eye $3\text{-}3^1/_2$ in head, interorbital narrow. Snout blunt, shorter than eye, tip before lower margin of eye. Jaws subequal. Maxillary extends to below middle of eye. Teeth in several rows. In upper jaw outer row enlarged. In lower jaw outer row enlarged, extending to halfway the jaw, last tooth is a weak canine; inner row a little enlarged. Tongue rounded. Three to five spines at the angle of preopercle. Scales ctenoid. Head scaled above behind eye, on cheek and opercle. Anterior rays of first dorsal fin prolonged beyond the membrane, especially the third ray. Caudal fin rounded, shorter than head. Pectoral fin a little longer than head. Ventral fins a little shorter. Colour brown. Each scale, except those on back, with a bluish spot. Body with large, irregular, brownish crossbars and blotches. Dorsal fins, anal and caudel fin brownish with blue dots. Length 48 mm.

Habitat: Sumatra (Pulu Ajer!); Cocos Islands (Nova Selma!); Simalur (Sinabang!); Nias (Telak Dalem!, Labewa!); Java (Bay of Djakarta!); Sulu Islands (Sitankai, Sipankot!); Morotai!. — Seychelles!, Suez!, Red Sea, India!, Japan, Philippines, Pelew Islands, Marianes (Guam!), Ponape, Samoa, Society Islands, Hawaii Islands, New Hebrides, Fiji, Polynesia, Micronesia, Australia (Port Bowen!, Cape York).

Type of *Asterropteryx albilosus* seen in the Queensland Museum, type and paratype of *Eleotris miniatus* seen in B.P. Bishop Mustum.

2. **Asterropteryx ensiferus** (Blkr.)

Eleotriodes cyanostigma Bleeker, Ned. Tijdschr. Dierk. 2, 1865, p. 150 (not of Blkr., Nat. Tijdschr. Ned. Indië 8, 1855, p. 452).
Brachyeleotris ensifera Bleeker, Versl. Ak. Amsterdam (2) 8, 1874, p. 375. — o.c. (2) 11, 1877, p. 86.
Asterropteryx ensifer M. Weber, Siboga Exp. Fische 1913, p. 454.
Asterropteryx ensiferus and *Brachyeleotris ensifera* Koumans, Zool. Meded. Leiden 22, 1940, pp. 147, 181.
Asterropteryx ensifer Herre, Proc. Biol. Soc. Washington 57, 1944, p. 7.

D. 1 VI; D. 2 I. 10; A. I. 9; P. 17; L.l. ± 25; L.tr. ± 8; Predorsal scales 5-6.

Body compressed, height about 3 in length, 4 in total length. Head compressed, about 3 in length, 4 in total length. Eye 3 in head, interorbital narrow. Snout blunt, shorter than eye, tip before lower margin of eye. Jaws subequal. Maxillary extends to below middle of eye. Teeth in several rows. In upper jaw outer row enlarged. In lower jaw outer row with some larger teeth on each side, the last tooth is a weak canine. At the angle of preopercle a single spine, which is directed backwards and extends to posterior margin of opercle or not so far. Scales ctenoid. Head scaled above behind the eyes, on cheek and opercle. Third ray of first dorsal fin ends in a long threat like prolongation. Pectoral, ventral and caudal fin not shorter than head. Colour grayish brown, belly reddish. A dark transverse band from eye, passing end of mouth to chin, where it meets the band of the opposite side. Body with 6 transverse bands on dorsal half, the sixth, before caudal fin, encircles the caudal peduncle. Scales with bluish spots. Length 35 mm.

Habitat: Postiljon Islands (Sarassa!); Sulu Islands (near Jolo, Bongao!); Nenusa Islands (Karaton!); Buru (Kajeli!); ?Banda. — In sea.

Type seen in the Leiden Museum.

3. **Eleotris** Bloch ed. Schneider

(Bloch ed. Schneider, Syst. Ichth. 1801, p. 65)

Eleotris Gronovius, Zooph. 1763, p. 83 (rejected).
Culius Bleeker, Nat. Tijdschr. Ned. Indië 11, 1856, p. 411.

Body oblong to elongate, anteriorly cylindrical, posteriorly

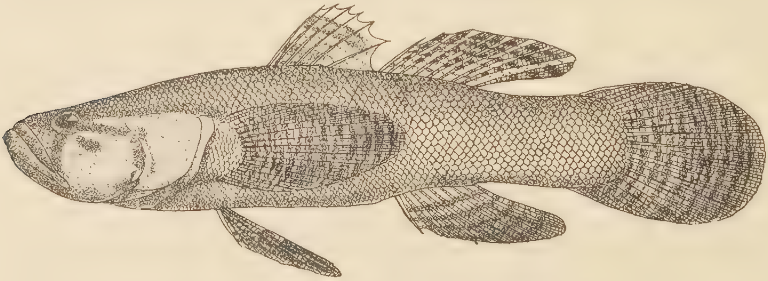

Fig. 74. *Eleotris fusca* (Bl. Schn.). × 5/7.

compressed, covered with 42 to about 70 scales, ctenoid posteriorly, becoming cycloid before first dorsal fin. Head depressed, scaled above from between the eyes or behind the eyes, laterally totally scaled or partly scaled. Scales of head cycloid. Eye small. Mouth oblique, lower jaw prominent. Teeth in several rows, outer row enlarged. No canines. Tongue rounded. A single downwards curved spine at the angle of preopercle. Gillopenings not continued forward below, isthmus broad. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 and A. I. 8-9. Caudal fin oblong.

Distribution: Tropical seas, entering rivers.

Key to the Indo-Australian species of Eleotris

1. L.l. 72-75; L.tr. 19-20; Predorsal scales 60 . . 1. *E. eigenmanni* p. 293.
2. L.l. 60-65; L.tr. 16-19; Predorsal scales 50 . . 2. *E. fusca* p. 294.
3. Less than 60 scales in L.l.
    A. In middle of caudal peduncle 11-12 scales in a transversal line . . . . 3. *E. melanosoma* p. 297.
    B. In middle of caudal peduncle 8-9 scales in a transversal line.
        a. L.tr. 14; Predorsal scales 60. Length of caudal peduncle less than 2 times its depth. Snout scaled . . . . 4. *E. oxycephala* p. 299.
        b. L.tr. 13-14; Predorsal scales 40. Length of caudal peduncle about 2 times its depth. Snout naked . . . . 5. *E. insulindica* p. 300.
        c. L.tr. 11-12; Predorsal scales 40. Length of caudal peduncle less than 2 times its depth. Snout naked . . . . 6. *E. macrolepis* p. 301.

1. **Eleotris eigenmanni** Popta

Eleotris eigenmanni Popta, Zool. Meded. Leiden 6, 1921, p. 206.

D. 1 VI; D. 2 I. 8-9; P. 17-18; L.l. 72-75; L.tr. 19-20; Predorsal scales 60.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $5^{3}/_{4}$-$6^{6}/_{7}$ in total length. Head depressed, $3^{2}/_{5}$-$3^{3}/_{5}$ in total length. Eye $6^{4}/_{5}$-$7^{1}/_{2}$ in head, interorbital about 2 eyediameters. Snout 4-$4^{1}/_{4}$ in head. Anterior nostril in a short tube. Lower jaw prominent. Teeth in several rows, outer and inner row enlarged. Supraopercular groove distinct. Some mucous canals radiate under eye, some longitudinal ones on cheek. Spine of preopercle pointed. Scales of body ctenoid, on head, nape and belly cycloid. Head scaled above between and behind the eyes, on cheek and opercle. There are 14-15 scales in a transversal line in middle of caudal peduncle. Caudal peduncle $1^1/_2$ times longer than high. First dorsal fin higher than half the height of body, second, third and fourth rays are the longest. Second dorsal and anal fin higher than first dorsal fin, but lower than body. Pectoral fin rounded, a little longer than postorbital part of head. Ventral fins do not reach anus. Caudal fin rounded, shorter than head without snout. Colour brown above, brownish yellow below. Fins yellow with brown spots. Length 127 mm.

Habitat: Muna (Raha!).
Type seen in the Leiden Museum.

Note: This species is very close to, perhaps identical with *Eleotris fusca* (Bl. Schn.).

2. **Eleotris fusca** (Bl. Schn.) (Fig. 74, p. 292)

Poecilia fusca Bloch ed. Schneider, Syst. Ichth. 1801, p. 453.
Cobitis pacifica (Forster) Bloch ed. Schneider, o.c. p. 453.
Cheilodipterus culius Hamilton Buchanan, Gangetic Fishes 1822, pp. 55, 367, pl. 5 fig. 16.
Eleotris nigra Quoy & Gaimard, Zool. Voy. Uranie et Physicienne 1824, p 259, pl. 60 fig. 2.
Eleotris mauritianus Bennett, Proc. Comm. Zool. Soc. London 1, 1831, p. 166.
Eleotris nigra Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 233.
Eleotris brachyurus Bleeker, Verh. Bat. Gen. 22, 1849, p. 20.
Eleotris melanurus Bleeker, o.c. p. 21.
Eleotris pseudacanthopomus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 276.
Eleotris nigra Bleeker, Verh. Bat. Gen. 25, 1853, p. 105, pl. 1 fig. 3.
Culius niger Bleeker, Nat. Tijdschr. Ned. Indië 11, 1856, p. 411.
Culius pseudacanthopomus Bleeker, o.c. p. 411.
Eleotris cavifrons Blyth, Journ. Asiat. Soc. Bengal 29, 1860, p. 145.
Eleotris incerta Blyth, o.c. p. 146.
Eleotris fusca Günther, Cat. Fishes 3, 1861, p. 125.
Culius fuscus Bleeker, Versl. Ak. Amsterdam 14, 1862, p. 111.
Eleotris fusca Day, Fishes Malabar 1865, p. 115.
Eleotris soaresi Playfair, Fishes Zanzibar 1866, p. 74, pl. 9 fig. 4.
?*Eleotris sandwicensis* Vaillant & Sauvage, Rev. Mag. Zool. (3) 3, 1875, p. 280.
Eleotris fusca Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 188.
Culius fuscus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 40.

Eleotris cavifrons Day, Fishes India 1878, p. 313, pl. 65 fig. 6. — Fauna Brit. India Fishes 2, 1889, p. 293.
Eleotris fusca Day, Fishes India 1878, p. 313, pl. 65 fig. 7. — Fauna Brit. India Fishes 2, 1889, p. 293.
Eleotris (Culius) fusca Sauvage, Poissons de Madagascar 1891, p. 381, pl. 40A fig. 1.
?*Eleotris fusca* Jordan & Snyder, Proc. U.S. Nat. Mus. 24, 1902 (1901), p. 45.
?*Eleotris fusca* Jordan & Evermann, o.c. 25, 1902, p. 361.
Eleotris (Culius) fusca M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 257.
Eleotris (Culius) fuscus M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 36.
Eleotris (Culius) fuscus De Beaufort, Bijdragen Dierkunde 1913, p. 136.
?*Eleotris fusca* Pietschmann, Jahrb. Nass. Ver. f. Naturk. in Wiesbaden 66, 1913, p. 199.
Eleotris fuscus M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 596.
Eleotris (Oxyeleotris) urophthalmoides M. Weber, Siboga Exp. Fische 1913, p. 447 (not of Blkr.).
Eleotris (Culius) fusca M. Weber, o.c. p. 449.
Eleotris (*urophthalmoides*?) juv. M. Weber & De Beaufort, Zool. Resultate in J. P. Kleiweg de Zwaan, Die Insel Nias bei Sumatra 1915, p. 273 (not of Blkr.).
Eleotris fusca McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 266 (see for synonyms).
?*Eleotris fusca* Barnard, Ann. South African Mus. 21, 1927, p. 810.
Eleotris fusca Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 30, pl. 2 fig. 1.
Eleotris fusca Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 392.
Eleotris (Culius) fusca Pellegrin, Mem. Ac. Malgache 14, 1933, p. 129, fig. 72.
Eleotris fusca Giltay, Mem. Mus. Roy. Hist. Nat. Belgique Hors Serie 5, 1933, p. 90.
Eleotris fusca Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 345.
Eleotris pisonis fusca Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 42.
Culius fuscus Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 129, fig. 2.
Eleotris fusca Koumans, Mem. Indian Mus. 13, 1941, p. 312.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 15-18; L.l. 60-65; L.tr. 16-19; Predorsal scales 50.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_4$-$4^3/_4$ in length, 5-6 in total length. Head pointed, depressed, 3-$3^1/_2$ in length, 4-$4^1/_2$ in total length. Frontal profile above eye straight to concave. Eye 5-6 in head, interorbital 1-$1^2/_3$ eyediameter. Snout pointed, as long as eye, tip before upper part of eye. Anterior nostril near margin of snout, in a short tube. Lower jaw prominent. Maxillary extends to posterior part of eye, or not so far. Teeth in many rows, small. In upper jaw outer row a little enlarged, subequal. In lower jaw outer row and laterally inner row enlarged, unequal. In interorbital space two longitudinal mucous canals, laterally of which a number of short transversal canals towards the eye. Two longitudinal mucous canals on cheek, crossed by canals radiating under eye. No pores on head. Supraopercular groove distinct. Spine of preopercle pointed, curved. Scales of body ctenoid posteriorly, cycloid anteriorly. Head scaled above between and behind the eyes, on cheek and opercle. Snout and below eye naked. There are 12-14 scales in a transversal line in middle of caudal peduncle. Caudal peduncle much less than 2 times longer than high. First dorsal fin obtuse, half of height of body, second, third and fourth rays are the longest. Second dorsal and anal fin higher than first dorsal fin, but lower than body. Pectoral fin rounded, longer than head without snout. Ventral fins shorter than pectoral fin. Caudal fin obtusely rounded, about as long as head, or a little longer. Colour blackish green above, blackish orange below. Each scale of the side with a dark spot, forming together longitudinal lines. Finmembranes violet, rays orange. First dorsal fin with 2-3 longitudinal dark bands. Second dorsal, pectoral and caudal fin with small dark stripes. Base of pectoral fin above often with red to dark blotch. Often a dark blotch posteriorly at the upper part of caudal peduncle. Young specimens often with dark stripe along supraopercular groove. Length 160 mm.

Nom. indig.: Ikan njerreh (Jav.), Kemboku (Sumba).

Habitat: Singapore; Pulu Weh (Sabang!); Sumatra (Tandjong, Benkulen!, Padang, Priaman, Belawan!, Labuan Batu!, Kuala Andjir!, Tapatuan!); Simalur (Ajer Tadjun!, Sinabang!, Lugu!, Lasikin!); Nias (Lahewa!, Gunung Sitoli!, Lolowau!); Pulu Nako!; Enggano (Meok!); Java (Patjitan, Pasuruan, Nusa Kambangan!, Kali Baron Djocja!, Dirk de Vries bay!, Palabuan Ratu!, Gombang); Bali (Boleleng!); Lombok (river of Pidjot bay!, Labuan Tring!); Sumbawa (Bima, Brang Nee river!, Wera river!); Sumba (Pajeti!, Karuni!, Leku, Laora!, river between Mengili and Wasung!); Flores (river Bari!, river Donda!, Reo!, Mbawa!, Sikka!, Endeh!, Konga river!, Alo Wai!, Lamunda!, Maumeri!); Adonare (river Wuré!); Savu (Seba!); Rotti!; Timor (Atapupu!, Mota Berluli!, Kupang!); Babber (river Toilila!); Wetar!; Kisser!; Borneo; Sulu Islands (Tawi Tawi); Celebes (Badjoa, Boni river!, Menado, Klabatdiatas, Palima Tjenrana!, river of Kwandang bay!, Penango!, Gorontalo!, Seweili, Boloang, Sabang); Kabaena!; Talaud Islands (Beo!, Gunung Duata); Siau!; Great Sangir (Taruna!); Saleyer (rivers Bagkalan and

Bonea!); Buton (Baubau river!); Sula Archipelago!; Taliabu (Wai Meha!); Halmahera; Morotai!; Groot Bastaard!; Sadjong!; Sembalan!; Ternate!; Batjan (Labuha); Obi major!; Buru (Kajeli, Wá Tina!, Leksula!); Ceram (Wahai); Nusa Laut!; Ambon (Batu Merah!, Ajer Larike!, Ajer Hatu!); Kei Islands (Elat); Aru Islands (Waskai river Wokam, Seltutti Kobroor); Waigeu (Wai Sa!, Wai Ha!, Mumes!, river Rabiai!, river Bajon!); Salawati (Manoi); New Guinea (Mbai river Humboldt bay!, Hollandia!, Jakati river!, river Mawi!, river Klipong!, Bogadjun near Stephansort, brook near Sĕkā, Tanah Merah!, Mamapiri!, river Mosso!); Island Roon (Jendu!); Biak Island. — East coast of Africa, Madagascar!, Mauritius, Johanna, Seychelles, India!, Ceylon!, Andamans!, Nicobars, Siam, China, ?Japan!, Riu Kiu Islands, ?Formosa, Philippines, Melanesia, Polynesia, Micronesia. — In rivers and estuaries.

Specimens of *Eleotris cavifrons* from the Andamans, Capt. Hodge, from the collection of the Asiatic Society of Bengal seen.

Note: *Eleotris fusca* is hardly different from *E. pisonis* (Gmel.) from America.

3. **Eleotris melanosoma** Blkr.

Eleotris melanosoma Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 705.
Eleotris acanthopomus Bleeker, o.c. 4, 1853, p. 275.
Culius acanthopomus Bleeker, o.c. 11, 1856, pp. 411, 412.
Culius melanosoma Bleeker, o.c. 11, 1856, p. 412.
Eleotris macrocephalus Bleeker, o.c. 13, 1857, p. 70.
Eleotris melanosoma Günther, Cat. Fishes 3, 1861, p. 126.
Culius melanosoma Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 43.
Culius macrocephalus Bleeker, o.c. p. 45.
Eleotris fusca Seale, Occ. Pap. B.P. Bishop Mus. 1 no. 3, 1901, p. 124 (not of Bl. Schn.).
Eleotris (Culius) macrocephalus M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 35.
Eleotris (Culius) melanosoma M. Weber, o.c. p. 36.
Eleotris macrocephalus M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 597.
Eleotris melanosoma M. Weber, o.c. p. 597.
Eleotris (Culius) melanosoma De Beaufort, Bijdragen Dierkunde 1913, p. 136.
Eleotris isthmensis Meek & Hildebrand, Field. Mus. Nat. Hist. Zool. 10, 1916, p. 359.
Eleotris melanosoma Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 33.
Eleotris melanosoma Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 393.
Eleotris macrocephalus Fowler, o.c. p. 393.
Eleotris melanosoma Herre, Field. Mus. Nat. Hist. Zool. 21, 1936, pp. 346, 453.

Eleotris pisonis oxycephala Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 41 (pro parte).
Culius melanosoma Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 129, fig. 2.
Eleotris isthmensis Koumans, Zool. Meded. Leiden 22, 1940, p. 140 (as synonym).
Eleotris melanosoma Koumans, Mem. Indian Mus. 13, 1941, p. 314.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 15-19; L.l. 45-55; L.tr. 14-15; Predorsal scales 40-45.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_2$-$5^1/_2$ in length, $5^1/_2$-7 in total length. Head pointed, depressed, $2^3/_4$-$3^1/_2$ in length, $3^2/_3$-$4^1/_2$ in total length. Frontal profile straight to a little concave. Eye $4^1/_2$-$5^1/_2$ in head, interorbital 1-$1^2/_3$ eyediameter. Snout pointed, as long as eye, tip before upper part of eye. Anterior nostril near margin of snout in a short tube. Lower jaw prominent. Maxillary extends to below middle of eye, or a little farther. Teeth in many rows, small. In upper jaw outer row a little enlarged, subequal; inner row a little enlarged. In lower jaw outer and inner row a little enlarged. Preopercular spine conical, curved. Mucous canals as in *E. fusca.* Supraopercular groove distinct. No pores on head. Scales of body ctenoid posteriorly, cycloid anteriorly. Snout naked, head scaled above between and behind eye, on cheek and opercle. Eleven to twelve scales in a transversal line in middle of caudal peduncle. Length of caudal peduncle less than 2 times its depth. First dorsal fin obtuse, about half of height of body, second, third and fourth rays are the longest. Second dorsal and anal fin higher than first dorsal fin, about as high as body. Pectoral fin obtuse, about as long as head. Ventral fin a little shorter. Caudal fin obtuse, a little shorter than head. Colour dusky red or dusky green above, lighter below. Fin membranes dusky to violet, rays orange to dusky. Rays of dorsal fins, caudal and pectoral fin with dark spots. Dorsal and anal fins with dark longitudinal stripes. Base of pectoral fin above usually with dusky blotch. Length 135 mm.

Nom. indig.: Gaful (Buru), Bakut (Samarinda).

Habitat: Singapore; Pulu Weh!; Sumatra (Benkulen, Ulakan, Padang, Priaman); Nias (Lahewa!, Lolowau); Java (Besoeki!); Lombok (Ampenam!); Sumba (Kambera river!); Flores (river Bari!, river Nargi near Konga!); Timor (Atapupu); Borneo (Kuma river, Samarinda!); Celebes (Sumalate!, Boni river near Balang Nipa!); Kabaena!; Sangir Archipelago (Peta); Morotai!; Batjan (Labuha); Buru (Kajeli!, Wá Tina!); Ceram (Wahai); Ambon!; Waigeu (river Wai ha, Waiu Waigee!); Aru Islands (Wammer, river near Wangil!, brook near Udju!, Manumbai!); New Guinea (river Mbai!, Humboldt bay!, Sepik river). — India!, Japan, Philippines (Mindanao!), New Caledonia!, New Britain (Jacquinot bay!), Tahiti (Tautira valley!), Guam!, Samoa Isl., Solomon Islands, New Hebrides, America (Canal zone at Atlantic coast at Mindi!). — In estuaries and rivers.

Types of *Eleotris macrocephalus* and *melanosoma* seen in the Leiden Museum, type of *Eleotris isthmensis* seen in Field Museum Nat. Hist.

4. **Eleotris oxycephala** Temm. & Schl.

Eleotris oxycephala Temminck & Schlegel, Fauna Japonica Poissons 1845, p. 150, pl. 77 figs. 4, 5.
Eleotris cantherinus Richardson, Rep. 15th meet. Br. Ass. in Rep. Ichth. Chine 1845 (1846), p. 209.
Eleotris oxycephala Günther, Cat. Fishes 3, 1861, p. 115.
Eleotris oxycephala Kner, Zool. Reise Novara Fische 1, 1865, p. 185.
Culius oxycephalus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 105. — Versl. Ak. Amsterdam (2) 11, 1877, p. 47.
Eleotris oxycephalus Jordan & Snyder, Proc. U.S. Nat. Mus. 24 (1901) 1902, p. 46.
Eleotris balia Jordan & Seale, o.c. 29, (1905) 1906, p. 526, fig. 6.
Eleotris pisonis oxycephala Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 41 (pro parte).
Eleotris balia Koumans, Zool. Meded. Leiden 22, 1940, p. 126 (as synonym).

D. 1 VI; D. 2 I. 8; A. I. 8; P. 16; L.l. 50-55; L.tr. 14; Predorsal scales 60.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $7^1/_3$ in total length. Head pointed, depressed, 4 in total length. Frontal profile a little concave. Eye $5^1/_2$-6 in head, interorbital 1-$1^2/_3$ eyediameter. Snout pointed, a little longer than eye, tip before upper margin of eye. Anterior nostril near margin of snout, in a short tube. Lower jaw prominent. Maxillary extends to below anterior half of eye. Teeth in several rows, small, outer and inner row a little enlarged. Two longitudinal mucous canals on cheek, crossed by 4 transversal ones. Supraopercular groove distinct. No pores on head. Preopercular spine conical, not curved. Scales of body ctenoid posteriorly, cycloid anteriorly. Head scaled on snout, above behind eye, on cheek and opercle. Eight scales in a transversal line in middle of caudal peduncle. Length of caudal peduncle less than 2 times its depth. First dorsal fin obtuse, less than half the height of body, second, third and fourth rays are the longest. Second dorsal and anal fin a little higher than first dorsal fin. Pectoral fin obtuse, a little longer than postorbital part of head. Ventral fin a little shorter. Caudal fin obtusely rounded, longer than postorbital part of head. Colour dusky green above, orange below. Supraopercular groove dusky. Laterally about 10 diffuse longitudinal streaks from head to caudal. Finmembranes violet, rays orange. Membranes and rays with dark spots. Length 210 mm.

Habitat: Java (according to Kner). — China!, Hongkong!, Japan!, Australia (Sydney, according to Kner).

Note: The locality "Java", stated by Kner probably is erroneous.

5. **Eleotris insulindica** (Blkr.)

Culius insulindicus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 107. — Versl. Ak. Amsterdam (2) 11, 1877, p. 48.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 16-17; L.l. 52-55; L.tr. 13-14; Predorsal scales 40.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-5$^1/_2$ in length, 6-7 in total length. Head pointed, depressed, 3-3$^1/_4$ in length, 3$^2/_3$-4 in total length. Frontal profile straight. Eye 5-6 in head, interorbital 1-1$^1/_3$ eyediameter. Snout pointed, about as long as eye, tip before upper part of eye. Anterior nostril near margin of snout in a short tube. Lower jaw prominent. Maxillary extends to below posterior half of eye. Teeth in many rows, small. In upper jaw outer row a little enlarged, subequal. In lower jaw anteriorly outer row, laterally inner row enlarged, unequal. Mucous canals as in *Eleotris fusca*. Supraopercular groove distinct. No pores on head. Preopercular spine pointed, curved. Scales of body posteriorly ctenoid, anteriorly cycloid. Head naked on snout and under eye, scaled above behind eye, on cheek and opercle. The scales on cheek are deciduous. Nine scales in a transversal line in the middle of caudal peduncle. Length of caudal peduncle about 2 times its depth. First dorsal fin obtuse, half of height of body, second, third and fourth rays are the longest. Second dorsal and anal fin higher than first dorsal fin, but lower than body. Pectoral fin obtuse, a little shorter than head. Ventral fin shorter than pectoral fin. Caudal fin obtusely rounded, a little shorter than head. Colour dusky above, reddish green to dusky below. Finmembranes violet, rays orange. First dorsal fin with 2-3 dark longitudinal streaks. Second dorsal, anal and pectoral fin spotted. Base of pectoral fin above often with dark blotch. Length 114 mm.

Habitat: Singapore; Sumatra (Padang); Buru (Kajeli); Ambon; Timor (Kupang). — In estuaries.

Types seen in the Leiden Museum.

6. **Eleotris macrolepis** (Blkr.)

Culius macrolepis Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 109. — Versl. Ak. Amsterdam (2) 11, 1877, p. 50.
Eleotris (Culius) macrolepis M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 257. — o.c. 9 Zool. 4, 1913, p. 597.
Eleotris macrolepis Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 393.
Eleotris macrolepis Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 451, fig. 49.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 15-16; L.l. 42-45; L.tr. 11-12; Predorsal scales 40.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 4-5 in length, 5-6 in total length. Head pointed, depressed, $2^3/_4$-3 in length, $3^1/_2$-4 in total length. Frontal profile a little concave above eye. Eye 5-$5^1/_2$ in head, interorbital $1^1/_2$-$2^1/_2$ in head. Snout pointed, a little shorter to longer than eye, tip before upper part of eye. Anterior nostril near margin of snout in a short tube. Lower jaw prominent. Maxillary extends to below posterior part of eye. Teeth in many rows, small. In upper jaw outer row a little enlarged, subequal. In lower jaw outer and inner row enlarged, unequal. Mucous canals as in *E. fusca*. Supraopercular groove distinct. No pores on head. Preopercular spine curved. Scales of body ctenoid posteriorly, cycloid anteriorly. Head scaled above behind eye, on cheek and opercle. Snout naked, below eye naked. Eight to nine scales in a transversal line in middle of caudal peduncle. Length of caudal peduncle less than 2 times its depth. First dorsal fin obtuse, half of height of body, second, third and fourth rays are the longest. Second dorsal and anal fin higher than first dorsal fin. Pectoral fin obtuse, longer than, to a little shorter than head without snout. Ventral fin a little shorter than pectoral fin. Caudal fin obtusely rounded, shorter or longer than head without snout. Colour dusky green above, greenish orange below.

Finmembranes dusky, rays orange. First dorsal fin with 2 dark longitudinal streaks. Second dorsal and caudal fin spotted. Base of pectoral fin above with dark to red blotch. Length 200 mm.

Habitat: Ambon!; New Guinea (Humboldt bay near Hollandia!, river Klipong!). — In sea and estuaries.

Types seen in the Leiden Museum.

Note: A specimen of 200 mm shows: Height of body 5 in length, 6 in total length. Head $2^3/_4$ in length, $3^1/_2$ in total length. Eye 8 in head, interorbital $2^1/_2$ eyediameter. Snout $1^1/_2$ eyediameter. Pectoral and caudal fin shorter than head without snout.

4. **Odontobutis** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 305)

Body elongate, anteriorly cylindrical, posteriorly compressed. Head depressed, scaled above and laterally. Interorbital crests naked, feeble. Scales about 40 in linea longitudinalis. Teeth in some rows, outer row a little enlarged, no canines. Lower jaw prominent. Gill-openings continued forward below, isthmus narrow. First dorsal fin with 6-8 rays. D. 2 I. 8-9; A. I. 6-7.

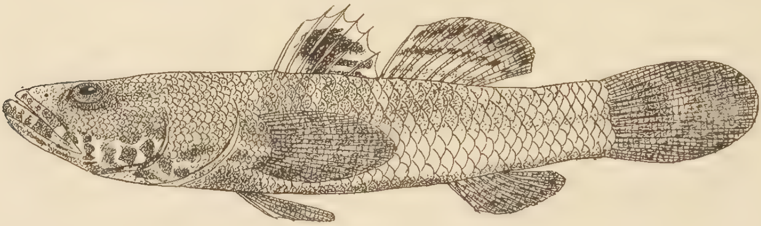

Fig. 75. *Odontobutis obscura* (Temm. & Schl.). × $^5/_6$.

Distribution: Japan, China, Auckland, Philippines, ?Java.

1. **Odontobutis obscura** (Temm. & Schl.) (Fig. 75, p. 302)

Eleotris obscura Temminck & Schlegel, Fauna Japonica Poissons 1845, p. 149, pl. 77 figs. 1, 2, 3.
Eleotris obscura Günther, Cat. Fishes 3, 1861, p. 115.
Eleotris obscura Kner, Zool. Reise Novara Fische 1, 1865, p. 185.
Odontobutis obscurus Jordan & Snyder, Proc. U.S. Nat. Mus. 24, 1902 (1901), p. 43.
Mogurnda obscura Jordan & Seale, o.c. 28, 1905, p. 526.

Odontobutis obscura Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 55.
Mogurnda obscura Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 44, fig. 4.
Odontobutis obscurus Harry, Proc. Calif. Zool. Club I, No. 3, 1948, fig. 5 and 6.

D. 1 VI-VIII; D. 2 I. 8-9; A. I. 6-7; P. 15; L.l. 36-40; L.tr. ± 13-16; Predorsal scales ± 20.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 4 in length, 5-5$^1/_2$ in total length. Head pointed, depressed, 2$^2/_3$ in length, 3$^1/_5$-3$^3/_5$ in total length. Profile in young specimens straight, in adult on snout convex, between eyes concave. Eye 4-6 in head, interorbital $^1/_2$-2 eyediameters. Snout pointed, about as long as, or a little longer than eye, tip before middle of eye. Anterior nostril near margin of snout. Lower jaw prominent, in young specimens to below middle of eye, in adult to below posterior part of eye. Teeth in several rows, pointed, inner row movable, outer row a little enlarged. No distinct pores on head. Supraorbital crest low, smooth, without scales, no crest from snout to temporal region. Supraopercular groove distinct. There are two or three longitudinal mucous canals on cheek, the upper connected by a branch with the groove behind eye. Snout and preorbital scaleless. Scales on front to posterior nostrils. Cheek and opercle scaled, scales on cheek behind eye and on opercle much smaller. Scales of head, breast and belly cycloid, on nape and further on body ctenoid. No auxillary scales. Caudal peduncle less than 2 times longer than high. First dorsal fin obtuse, half or less of height of body, middle rays are the longest. Second dorsal and anal fin higher than first dorsal fin, but lower than body, obtuse, last rays not longer. Pectoral fin obtuse, longer than postocular part of head. Ventral fin a little shorter than postocular part of head. Caudal fin obtuse, rounded, longer than postocular part of head. Colour dusky olive above, greenish orange below. Young specimens on side of back with dusky blotches. Head, especially of young specimens, variegated below with dusky and yellowish orange. First dorsal fin dusky to violet, variegated with dusky. Membrane of the other fins violet, rays orange with dark streaks, which are longitudinally placed on second dorsal and anal fin, transversally on pectoral, ventral and caudal fin. Ventral fin sometimes totally dusky. Length 171 mm.

Habitat: Java (according to Kner). — China!, Japan! (river Kiusiu), Philippines (Zamboanga), Auckland.

Note: The locality "Java" stated by Kner probably is erroneous.

5. **Butis** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 304)

Body elongate, anteriorly cylindrical, posteriorly compressed, covered with about 30 ctenoid scales. Head flat, pointed, subcylindrical, scaled above from between or behind the eyes. Cheek scaled or naked. On head bony crests in interorbital and around the eyes. Lower jaw prominent. Teeth in several rows, outer row a little larger or not enlarged. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 and A. I. 8-9.

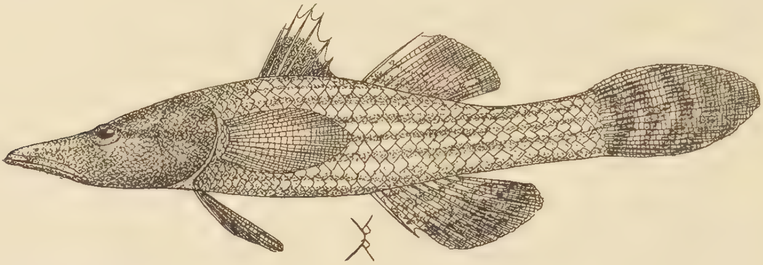

Fig. 76. *Butis butis* (H. B.). × 2/3.

Distribution: East Africa, India to Formosa and Queensland.

Key to the Indo-Australian species of Butis

1. Interorbital space and below eye scaled.
   - A. Height of caudal peduncle 1½ in its length. Outer row of teeth not enlarged. Maxillary extends to below anterior part of eye. Scales with auxiliaries. Scales of head cycloid. . . . . 1. *B. prismaticus* p. 305.
   - B. Height of caudal peduncle 2 or more than 2 in its length. Scales of head ctenoid.
     - *a.* Height of body 5-6 in length, 6-8 in total length, shorter than, or about as long as distance from tip of snout to posterior margin of eye. Maxillary extends to below anterior part of eye, or not so far. Interopercle naked or only with a few scales.

a′. Teeth of outer row enlarged. Scales of body and head with auxiliary scales. Ctenoid scales between eye and orbital crest . . . 2. *B. butis* p. 306.

b′. Teeth of outer row not or hardly enlarged. No auxiliary scales. No scales between eye and orbital crest. 3. *B. amboinensis* p. 308.

b. Height of body 4½-5 in length, 5-6 in total length, longer than distance from tip of snout to posterior margin of eye. Maxillary extends to below middle of eye. Interopercle scaled with a row of scales. Teeth of outer row not enlarged. Auxiliary scales present. Ctenoid scales between eye and orbital crest. . . . . 4. *B. melanostigma* p. 309.

2. Interorbital, cheek and snout naked. Teeth of outer row enlarged. Maxillary extends to below anterior part of eye. No auxiliary scales. Scales on head ctenoid. . . . . . 5. *B. gymnopomus* p. 311.

1. **Butis prismaticus** (Blkr.)

Eleotris prismatica Bleeker, Verh. Bat. Gen. 22, 1849, p. 23.
Eleotris butis Günther, Cat. Fishes 3, 1861, p. 116 (pro parte?).
Butis prismaticus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 61.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 19; L.l. 30; L.tr. 10; Predorsal scales 25.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5 in total length. Head pointed, depressed, $3^{1}/_{2}$ in total length. Dorsal profile straight. Eye 6-7 in head, interorbital 2 eye-diameters. Crest of interorbital and rostral region rough, on temporal region smooth. Snout pointed, longer than eye, tip before middle of eye. Lower jaw prominent. Maxillary extends to below anterior part of eye. Teeth in many rows, small, pointed, outer row not enlarged. In lower jaw laterally inner row a little enlarged. Supraopercular groove distinct. Two to three open pores on posterior margin of preopercle. Head scaled to between posterior nostril, snout naked. Cheek and opercle scaled. Scales of upper part of head and opercle and of body with auxiliary scales. Scales of body ctenoid, of head cycloid. Seven scales in a transversal line before caudal fin. Height of caudal peduncle posteriorly $1^{1}/_{2}$ times in its length. First dorsal fin obtuse, half of height of body, second, third and fourth rays are the longest. Second dorsal and anal fin higher than first dorsal fin, obtuse. Pectoral fin longer than postorbital part of head. Ventral fin shorter than pectoral fin. Caudal fin obtuse. Colour dusky green above, lighter below. Scales of body with yellowish transverse streak. First dorsal fin blackish, membrane of other fins violet, rays orange. Rays of second dorsal, ventral, anal and caudal fin spotted. Pectoral fin with black spot on base. Length 113 mm.

Nom. indig.: Puntang (Jav.).

Habitat: Strait Madura!.

Type seen in the Leiden Museum.

2. **Butis butis** (H.B.) (Fig. 76, p. 304)

Cheilodipterus butis Hamilton Buchanan, Gangetic Fishes 1822, pp. 57, 367.
Cheilodipterus butis Gray, Illustr. Indian Zool. 2, 1830-1834, pl. 93 fig. 3 (M.S. drawing of H.B.).
Eleotris humeralis Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 246.
Eleotris humeralis Bleeker, Verh. Bat. Gen. 22, 1849, p. 22.
Eleotris butis Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1178.
Eleotris melanopterus Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 706.
Butis butis Bleeker, o.c. 11, 1856, p. 412.
Butis melanopterus Bleeker, o.c. 14, 1857, p. 465.
Eleotris butis Günther, Cat. Fishes 3, 1861, p. 116 (pro parte or not of H.B.).
Eleotris melanotopterus Bleeker, Ned. Tijdschr. Dierk. 2, 1865, p. 150.
Butis butis Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 62.
Eleotris amboinensis Day, Fishes India 1878, p. 316 (not of Blkr.). — Fauna Brit. India Fishes 2, 1889, p. 297. (not of Blkr.).
Eleotris longicauda Ogilby, Proc. Roy. Soc. Queensland 23, 1910, p. 22.
Eleotris papa (de Vis M.S.) Ogilby, o.c. p. 24.
Eleotris (Butis) amboinensis M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 35 (not of Blkr.).
Eleotris (Butis) butis M. Weber, Siboga Exp. Fische 1913, p. 448.
Butis amboinensis McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 271, pl. 36 fig. 4 (not of Blkr. or only pro parte).
Butis butis Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 43, fig. 3.
Eleotris longicauda Koumans, Zool. Meded. Leiden 22, 1940, p. 175 (as synonym).
Eleotris papa Koumans, o.c. p. 175 (as synonym).
Butis butis Koumans, Mem. Indian Mus. 13, 1941, p. 317.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 18-21; L.l. 30; L.tr. 9-10; Predorsal scales ± 20.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-6 in length, 6-8 in total length, equal to snout and eye. Head pointed, depressed, $2^3/_4$-3 in length, $3^1/_2$-$3^4/_5$ in total length.

Profile concave. Eye 5-6 in head, interorbital 1-1$^1/_2$ eyediameter. Interorbital crest not denticulated, on each side two indistinct crests on snout. Snout pointed, much longer than eye, tip before inferior part of eye. Lower jaw prominent. Maxillary extends to below anterior margin of eye, or not so far. Teeth in many rows, in both jaws outer row enlarged. In lower jaw inner row enlarged. Supraopercular groove distinct. Two to three open pores on posterior margin of preopercle. An open pore on each side in interorbital, some pores along each orbital crest. Head scaled posteriorly on snout, between nostrils, on cheek and opercle with ctenoid scales. Interoperculum naked or only with a few scales. Ctenoid scales between eye and orbital crest. Scales of head and body with auxiliary scales; on breast and belly cycloid, on nape and laterally ctenoid. Five scales in a transversal line before caudal fin. Caudal peduncle more than 2 times longer than high. First dorsal fin pointed, half of height of body, second and third rays are the longest. Second dorsal and anal fin higher than first dorsal fin, but lower than body. Pectoral fin obtuse, not shorter than head without snout. Ventral fin shorter than pectoral fin. Caudal fin obtuse, about as long as head. Colour blackish, lighter below. Body with irregular cross bands. Head and body with reddish spots. On cheek and below eye rows of spots radiating from eye. First dorsal fin blackish, top red. Other fins have the membranes dusky to violet, the rays orange to red. Pectoral fin with one or with a double black spot, bordered by red, at the base. Rays of other fins spotted. Dorsal, anal and caudal fin bordered with red. Length 145 mm.

Nom. indig.: Bloso-watu (Jav.).

Habitat: Singapore!; Bintang (Rio); Sumatra (Telokbetong, Belawan!); Java (Djakarta!, Semarang, Surabaja, Pasuruan); Madura (Bangkallang, Kammal); Sumbawa (Bima beach!); Borneo (Bandjermasin, Sandakan!, Balikpapan!, Kota baru!); Celebes (Makassar!, Bulucomba, Kema, mouth Tello river!); Muna (Raha!); Buru (Kajeli); Ceram (Wahai); Ambon; Waigeu (Waiu waigee!); Aru Islands (Sungi Manumbai before Manumbai!); New Guinea (Noord river!, Pandanus creek!, Nambarre river!, Fak Fak!). — Pulu Ubin!, West coast of Malaya!, Penang, Ceylon!, Andamans!, Siam (KengSok!), Philippines (Samar, Los Banos!), Australia (Cairns!, Brisbane river!, Thursday Island!, Bremer river!). — In sea and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum, 4 specimens named *Eleotris amboinensis* from Day, Andamans, seen in Indian Museum, Calcutta, types of *Eleotris papa* and type of *E. longicauda* seen in Queensland Museum, Brisbane.

3. **Butis amboinensis** (Blkr.)

Eleotris amboinensis Bleeker, Nat. Tijdschr. Ned. Indië 5, 1853, p. 343.
Butis amboinensis Bleeker, o.c. 14, 1857, p. 405.
Eleotris amboinensis Günther, Cat. Fishes 3, 1861, p. 117.
Butis amboinensis Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 66.
Butis leucurus Jordan & Seale, Proc. U.S. Nat. Mus. 28, 1905, p. 794, fig. 13.
Butis butis Fowler, Proc. Ac. Nat. Sci. Philadelphia 57, 1905, p. 513 (pro parte, not of H.B.).
Butis amboinensis Jordan & Richardson, Bull. Bur. Fisheries 27, (1907) 1908, p. 276.
Eleotris amboinensis M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 598.
Eleotris (Butis) amboinensis De Beaufort, Bijdragen Dierkunde 1913, p. 136.
Eleotris butis M. Weber & De Beaufort, Zool. Resultate in J. P. Kleiweg de Zwaan, Die Insel Nias bei Sumatra 1915, p. 273 (not of H.B.).
Eleotris amboinensis Vinciguerra, Ann. Mus. Civ. Genova 50 (3a Ser. 10), 1926, p. 548.
Butis amboinensis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 46. — Field Mus. Nat. Hist. Zool. 21, 1936, pp. 343, 453.
Butis leucurus Koumans, Zool. Meded. Leiden 22, 1940, p. 123 (as synonym).
Butis amboinensis Koumans, Mem. Indian Mus. 13, 1941, p. 318.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 18-19; L.l. 30; L.tr. 9-10; Predorsal scales 20.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $5\text{-}5^1/_2$ in length, 6-7 in total length. Head depressed, $2^1/_2\text{-}3$ in length, $3^3/_4\text{-}4$ in total length. Profile straight to concave. Eye 5-6 in head, interorbital $1\text{-}1^1/_2$ eyediameter. Interorbital crest denticulated, two crests on snout. Snout pointed, less than 2 times eye, tip before middle of eye. Lower jaw prominent. Maxillary extends to below anterior margin of eye. Teeth in many rows, in upper jaw outer row not enlarged. In lower jaw outer row not or nearly not enlarged, laterally inner row enlarged. Short mucous canals radiate under eye. Two to three open pores on posterior margin of preopercle, some open pores along each orbital crest. Supraopercular groove distinct. Head scaled on snout, between nostrils, on cheek and opercle with ctenoid scales, some of which have auxiliary scales. No scales between eye and interorbital crest. Interoperculum naked. Scales of body without auxiliary scales, on breast and belly cycloid, on nape and laterally ctenoid. Five scales in a transversal line before base of caudal fin. Caudal peduncle more than 2 times longer than high. First dorsal fin pointed, about half of height of body, second and third rays are the longest. Second dorsal and anal fin higher than first dorsal fin, but lower than body. Pectoral fin obtuse, longer than head without snout. Ventral fin a little shorter. Caudal fin a little shorter than head, obtuse. Colour dusky green to olivous, lighter below. An indistinct stripe from eye to opercle. Head and body with dark spots. Scales of body with small orange to pearl like spots. First dorsal fin dusky, clouded with orange. Membranes of other fins dusky violet, rays orange. Rays of second dorsal, anal and caudal fin spotted. Second dorsal, ventral, anal and caudal fin bordered with red. Base of pectoral fin with black blotch, bordered anteriorly with red. Length 136 mm.

Nom. indig.: L'm Subul (Buru).

Habitat: Nias (Lahewa!, Gunung Sitoli!); Java (Tji Bening!, Djakarta!); Flores (river Konga!); Borneo (Baram!, Kubu Terentang!); Celebes (Menado!, river Lapa lupa near Tempe!); Buru (Wa Tina!, Kajeli!); Ceram (Kairatu!); Ambon; New Guinea (river Klipong!, Marienberg!, Mbai river!, Port Moresby!). — India (Mormugao bay!), Philippines (Negros!, Mindoro), Solomon Islands. — In sea, estuaries and rivers.

Specimens of Bleeker's collection seen in the Leiden Museum, type of *Butis leucurus* seen in U.S. Nat. Museum.

4. **Butis melanostigma** (Blkr.)

Eleotris melanostigma Bleeker, Verh. Bat. Gen. 22, 1849, p. 23.
Eleotris Wolffii Bleeker, Nat. Tijdschr. Ned. Indië 1, 1851, p. 253.
Eleotris melanostigma Günther, Cat. Fishes 3, 1861, p. 117.
Eleotris butis Günther, Ann. Mag. Nat. Hist. (4) 1, 1868, p. 264 (not of H.B.).
Butis melanostigma Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 68.
Eleotris butis Day, Fishes India 1878, p. 315, pl. 67 fig. 3 (not of H.B.). — Fauna Brit. India Fishes 2, 1889, p. 296 (not of H.B.).
Butis butis Fowler, Proc. Ac. Nat. Sci. Philadelphia 57, 1905, p. 513 (pro parte, not of H.B.).
Eleotris (Butis) melanostigma M. Weber, Abh. Senck. Naturf. Ges. 34, 1911, p. 35.
Eleotris melanostigma Vinciguerra, Ann. Mus. Civ. Genova 50 (3a Ser. 10), 1926, p. 551.
Butis butis Fowler & Bean, Proc. U.S. Nat. Mus. 71 art. 10, (1927) 1928, p. 11 (not of H.B.).
Butis butis Chevey, Trav. Inst. Oc. de l'Indochine, 4e Mem. 1932, p. 115, pl. 47.

?*Eleotris butis* Pellegrin, Mem. de Malgache 14, 1933, p. 122, fig. 68.
Butis melanostigma Koumans, Mem. Indian Mus. 13, 1941, p. 316.
Eleotris or *Butis butis* auct. (not or only pro parte of H.B.).

D. 1 VI; D. 2 I. 8; A. I. 8; P. 18-20; L.l. 30; L.tr. 9-10; Predorsal scales ± 25.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_2$-5 in length, 5-6 in total length, more than snout and eye. Head pointed, depressed, $2^3/_4$-3 in length, $3^2/_5$-$3^1/_2$ in total length. Profile straight to concave. Eye 5-6 in head, interorbital 1-$1^1/_2$ eyediameter. Interorbital crest smooth to denticulated. Two crests on snout. Snout pointed, less than 2 eyediameters, tip before middle or lower part of eye. Lower jaw prominent. Maxillary extends to below middle of eye. Teeth in many rows, outer row not enlarged. Supraopercular groove distinct. Two or three open pores on posterior margin of preopercle, some pores along each orbital crest. Snout scaled,, head scaled between nostrils, on cheek and opercle with ctenoid scales with auxiliaries. Ctenoid scales between eye and orbital crest. Interoperculum scaled. Scales of nape, breast, belly and laterally on body ctenoid, most of the scales have auxiliaries. Five scales in a transversal line before base of caudal fin. Caudal peduncle 2 times longer than high. First dorsal fin pointed, half of height of body, second and third rays are the longest. Second dorsal and anal fin higher than first dorsal fin, but lower than body. Pectoral fin obtuse, about as long as head without snout. Ventral fin a little shorter. Caudal fin a little shorter than head. Colour blackish green, lighter to orange below. Head and body with dark spots, on cheek and below eye radiating from the eye. First dorsal fin black to dusky. Membranes of the other fins dusky to violet, rays orange to red. Base of pectoral fin with black blotch, bordered with red. Rays of other fins spotted. Second dorsal, ventral and anal fin bordered with red. Length 142 mm.

Nom. indig.: Puntang (Jav.), Babalak (Sund.).

Habitat: Sumatra (Palembang, Sungei Serdang river!, Belawan!); Java (Djakarta!, Perdanan, Surabaja!); Madura! (Kammal); Borneo (Sambas, Kahajan, Bandjermasin, Samarinda!, Sarawak!. Baram!, Kapuas river!, Kubu Terentang!); Ambon!; Aru Islands (Sungei Kololobo Kobroor!). — Pulu Ubin!, India!, Siam (Bangkok!, Keng Sok!), Indo China, ?Madagascar. — In rivers and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum.

5. **Butis gymnopomus** (Blkr.)

Eleotris gymnopomus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 274.
Butis gymnopomus Bleeker, o.c. 12, 1856-1857, p. 215. — Versl. Ak. Amsterdam (2) 11, 1877, p. 70.
Butis gymnopomus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 51. — Field Mus. Nat. Hist. Zool. 21, 1936, p. 343.
Butis gymnopomus Koumans, Mem. Indian Mus. 13, 1941, p. 315.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 17; L.l. 30; L.tr. 10; Predorsal scales ± 14.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^3/_4$-5 in length, $5^1/_2$-6 in total length. Head pointed, depressed, $2^3/_4$-3 in length, $3^2/_5$-$3^3/_4$ in total length. Profile straight to a little concave. Eye 5-6 in head, interorbital 1 eyediameter. Crest between the eyes denticulated. Snout pointed, 2 eyediameters, tip before middle of eye, or lower margin of eye. Lower jaw prominent. Maxillary extends to below anterior part of eye. Teeth small, pointed, in many rows, those of inner and outer row enlarged. Supraopercular groove distinct. A number of mucous canals radiate under eye, one indistinct longitudinal canal on cheek. Two or three open pores on posterior margin of preopercle. An open pore on each side in interorbital, some pores along each orbital crest. Snout, interorbital and cheek naked, head only scaled above behind eye and on opercle with ctenoid scales, partly with auxiliaries. Scales of breast and belly cycloid, of nape and laterally on body ctenoid without auxiliaries. No scales between eye and orbital crest. Interoperculum naked. Five scales in a transversal line before base of caudal fin. Caudal peduncle 2 times longer than high. First dorsal fin pointed, half of height of body, second and third rays are the longest. Second dorsal and anal fin higher than first dorsal fin, about as high as body, upper margin concave, posteriorly pointed; in male last ray of second dorsal fin prolonged. Pectoral fin obtuse, about as long as head without snout. Ventral fin a little shorter. Caudal fin shorter than head. Colour dusky green to olivous above, lighter to orange below. Laterally on body 7-8 longitudinal dark stripes and small spots. First dorsal fin dusky, posteriorly yellowish red. Pectoral fin orange to red, base with dark spot. Second dorsal, ventral and anal fin dusky, bordered with red. Caudal fin dusky, with dark spots, bordered above and below with red. Rays of second dorsal fin spotted. Length 115 mm.

Nom. indig.: Tungulian (Sund.), Latâré (Tapah, Simalur?).

Habitat: Singapore; Banka (Marawang); Sumatra! (Benkulen, Padang, Ulakan, Priaman, Tapatuan!); Simalur (Labuan Badjan!, Lugu!); Nias! (Lolowau); Java! (Pedana, Patjitan, Djakarta!, Besoeki, Semarang!); Bali (Boleleng); Borneo (Sandakan); Celebes (river near Balang nipa!, river near Palopo!, Rumbia!); Kabaena!; New Guinea (Nambarre river!, Japero at mouth of Utakwa river!). — India (Patani river!), Philippines, Solomon Islands—In rivers an estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum.

6. **Prionobutis** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 305)

Body a little elongate, anteriorly cylindrical, posteriorly compressed, covered with about 39 ctenoid scales. Head obtuse, convex, totally scaled, or scaled above behind the eyes and on upper parts of cheek and opercle; with or without cutanian papillae and barbel-like papillae at the ventral side. Bony serrated crests on snout and interorbital. Jaws subequal. Teeth in several rows, outer row enlarged, no canines. Dorsal fins separate. First dorsal fin with 6 rays.

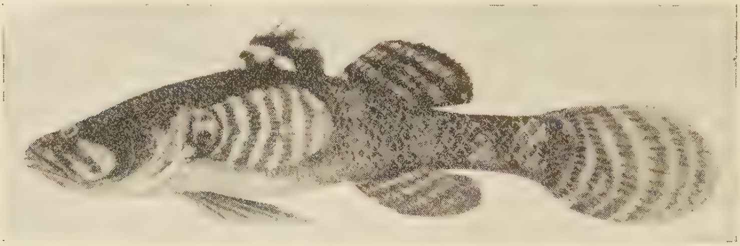

Fig. 77. *Prionobutis microps* (M. Weber). × 2/3. After M. Weber.

D. 2 I. 8; A. I. 7-8.

Distribution: India to China, Philippines, Indo-Australian Archipelago, Australia.

Key to the Indo-Australian species of Prionobutis

A. Head without cuticular papillae and barbel-like papillae at the ventral side of head. Head scaled above behind the eyes, on upper part of cheek and on opercle. No auxiliary scales. 1. *P. koilomatodon* p. 313.

B. Head with cuticular papillae near the jaws and barbel-like papillae at the ventral side of head.

a. Head scaled above behind the eyes, on upper part of cheek and opercle. No auxiliary scales . . . . 2. *P. dasyrhynchus* p. 314.

b. Head totally scaled. Auxiliary scales . . . 3. *P. microps* p. 315.

1. **Prionobutis koilomatodon** (Blkr.)

Eleotris koilomatodon Bleeker, Verh. Bat. Gen. 22, 1849, p. 21.
Eleotris caperatus Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1179.
Eleotris caperata Günther, Cat. Fishes 3, 1861, p. 117.
Eleotris caperata Day, Proc. Zool. Soc. London 1870, p. 694.
Prionobutis koilomatodon Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 73.
Eleotris caperata Day, Fishes India 1878, p. 315. — Fauna Brit. India Fishes 2, 1889, p. 296.
Prionobutis serrifrons Rutter, Proc. Ac. Nat. Sci. Philadelphia 1897, p. 84.
Butis serrifrons Jordan & Seale, Bull. Bur. Fisheries 26, (1906) 1907, p. 40.
Butis koilomatodon Jordan & Richardson, o.c. 27, (1907) 1908, p. 274.
Eleotris (Butis) koilomatodon M. Weber, Abh. Senck. Naturf. Ges. 34, 1911, p. 35. — Siboga Exp. Fische 1913, p. 448.
Eleotris Koilomatodon Vinciguerra, Ann. Mus. Civ. Genova 50 (3ª Ser. 10), 1926, p. 545.
Prionobutis koilomatodon Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 52, pl. 4 fig. 2.
Eleotris (Butis) koilomatodon Wu, Contr. Biol. Lab. Sci. Soc. China 7 Zool. Ser., 1931, p. 37.
Prionobutis koilomatodon Lin, Lingnan Sci. Journ. 13 no. 4, 1934, p. 686.
Prionobutis serrifrons Koumans, Zool. Meded. Leiden 22, 1940, p. 146 (as synonym).
Prionobutis koilomatodon Koumans, Mem. Indian Mus. 13, 1941, p. 319.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 19-21; L.l. 30; L.tr. 7-10; Predorsal scales 12-14.

Body a little elongate, anteriorly cylindrical, posteriorly compressed, height $3^3/_4$-4 in length, $4^2/_3$-5 in total length. Head obtuse, subcylindrical to a little compressed, 3-$3^1/_4$ in length, 4 in total length. Profile convex and concave. Eye 4-$4^1/_2$ in head, interorbital less than 1 eyediameter. Orbital crest denticulated. On each side on snout 2 denticulated crests. Snout obtuse, shorter than eye, tip before or below inferior margin of eye. Lower jaw prominent. Maxillary extends to below posterior part of eye, or to below middle of eye. Teeth small, outer row enlarged, inner row a little enlarged. Supraopercular groove distinct. Two or three indistinct open pores on posterior margin of preopercle. No papillae or barbels on head. Head naked on snout, interorbital, preorbital and lower part of cheek; scaled above behind eye, upper part of cheek and on opercle with ctenoid scales. Scales of breast and belly cycloid, on nape and body ctenoid, without auxiliaries. Five scales in a transversal line before base of caudal fin. Caudal peduncle 2 times longer than high. First dorsal fin obtuse, half of height of body, second and third rays are the longest. Second dorsal fin higher than the first, but lower than body, anteriorly higher than in middle, so that the profile is concave. Pectoral fin obtuse, about as long as head. Ventral fin a little shorter. Anal fin anteriorly lower than in middle, as long as second dorsal fin. Caudal fin oblong, about as long as head. Colour dusky green to olivous, lighter below. Scales of body often with a red spot. Tip of first dorsal fin dusky, posterior margin orange to pink. Pectoral fin red orange, base with black spot, bordered with red. Other finmembranes dusky, rays orange. Rays of second dorsal and anal fin spotted. Anal and caudal fin bordered with red. Length 80 mm.

Habitat: Singapore!; Pulu Weh!; Java (Djakarta!, Surabaja!); Madura! (Kammal); Borneo (Sarawak); Celebes (Makassar!); Ambon; Aru Islands (Sungi Kololobo on Kobroor). — Penang, India!, Ceylon (Colombo!), Siam (Paknam!), Indo-China, China (Hongkong, Foochow, Swatow!, Amoy!), Philippines (Cavite). — In sea and estuaries.

Types of *Eleotris caperatus* seen in British Museum (N.H.), type of *Prionobutis serrifrons* Rutter seen in Stanford University, specimens of Bleeker's collection of *Prionobutis koilomatodon* seen in the Leiden Museum.

2. **Prionobutis dasyrhynchus** (Gthr.)

Eleotris dasyrhynchus Günther, Ann. Mag. Nat. Hist. (4) 1, 1868, p. 265, pl. 12 fig. B.
Prionobutis dasyrhynchus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 75.
Eleotris (Butis) dasyrhynchus M. Weber, Siboga Exp. Fische 1913, p. 449.
Eleotris dasyrhynchus Vinciguerra, Ann. Mus. Civ. Genova 50 (3ª Ser. 10), 1926, p. 546.
Prionobutis dasyrhynchus Koumans, Zool. Meded. Leiden 20, 1937, p. 22.

D. 1 VI; D. 2 I. 8; A. I. 7; P. 19; L.l. 30; L.tr. 9; Predorsal scales 12.

Body a little elongate, height 4$^{3}/_{4}$ in length. Head very broad, depressed, 3$^{1}/_{3}$ in length. Cheek swollen. Eye about 8 in head, interorbital broad, 1$^{1}/_{2}$ eyediameter. Snout very broad, longer than eye. Maxillary extends to behind eye. Teeth small, outer row a little enlarged. Jaws and surroundings with cuticular papillae; ventral side of head with a row of barbel like papillae on each side. Head scaled above behind the eyes and on upper part of cheek and opercle. No auxiliary scales. First dorsal fin not of the height of body, middle rays are the longest. Second dorsal and anal fin higher than first dorsal fin, but lower than body. Pectoral fin a little shorter than head. Ventral fin shorter than pectoral fin. Caudal fin rounded, shorter than head. Colour according to Günther: "brownish black, each scale with the margin lighter; back with two or three yellowish blotches; the first, at the origin of the spinous dorsal, is sometimes absent; the second at the origin of the soft dorsal, and the third on the back of the caudal peduncle. Dorsal fins coloured as the body underneath, caudal nearly uniform white. Pectoral rays variegated with black." Length 65 mm.

Habitat: Borneo (Sarawak!, Baram river!, Batu Pangal!). — In rivers.

Types seen in the British Museum (N.H.).

3. **Prionobutis microps** (M. Weber) (Fig. 77, p. 312)

Pogoneleotris microps M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 258, pl. 12 figs. 4a, 4b.
Pogoneleotris microps Rendahl, Nijt. Mag. f. Naturvid. 60, 1922, p. 194.
Pogoneleotris microps Fowler, Mem. B. P. Bishop Mus. 10, 1928, p. 393.
Prionobutis microps Koumans, Zool. Meded. Leiden 20, 1937, p. 22.

D. 1 VI; D. 2 I. 8; P. 21-22; L.l. 30-32; L.tr. 10; Predorsal scales (to tip of snout) ± 35.

Body a little elongate and compressed, height 4-5 in length, 5-6 in total length. Head strongly depressed, profile straight to nearly convex, 3$^{1}/_{6}$-3$^{1}/_{3}$ in length, 4-4$^{1}/_{2}$ in total length. Eye 7-8$^{1}/_{2}$ in head, interorbital 2$^{1}/_{2}$-3 eyediameter. Snout broad, length of snout 2 times eye, tip before middle of eye. Lower jaw a little prominent. Maxillary extends to below middle or posterior margin of eye. Jaws and surroundings in adult with cuticular papillae, lower side of head on each side with a row of barbel like papillae. Nostrils close together, funneled. Teeth in broad bands, inner row in upper jaw and lower jaw a little enlarged. Tongue rounded. Isthmus very narrow. Short mucous canals radiate under eye, 3 longitudinal canals on cheek. On each side at dorsal end of gillopening a backwards directed open pore. Scales ctenoid, at their base a row of 5 auxiliary scales (a central large one and on each side 2 smaller ones). Head totally scaled with smaller scales. The auxiliaries decrease at the anterior part of body. First dorsal fin convex, lower than half the height of body, third ray is the longest. Second dorsal fin a little higher. Anal fin a little higher than second dorsal fin. Pectoral and ventral fin as long as head without snout. Caudal fin oblong, as long as head. Colour brown with indistinct darker clouds and longitudinal stripes. First dorsal fin with yellowish blotches, other fins dark. Second dorsal, anal, pectoral and caudal fin with rows of blotches. Length 230 mm.

Habitat: New Guinea (Tawarin river!, Merauke river!, Pandanus creek!, Noord river!, Mappi!). — Australia (Daly river). — In fresh and brackish water.

Types seen in the Amsterdam Museum.

7. **Eviota** Jenkins

(Jenkins, Bull. U.S. Fish Comm. 22, 1902 (1903), p. 501.)

Allogobius Waite, Rec. Austral. Mus. 5 prt. 3, 1904, p. 176.

Body a little elongate, compressed, covered with 22-28 ctenoid scales. Head slightly compressed, naked. Eye large. Mouth oblique.

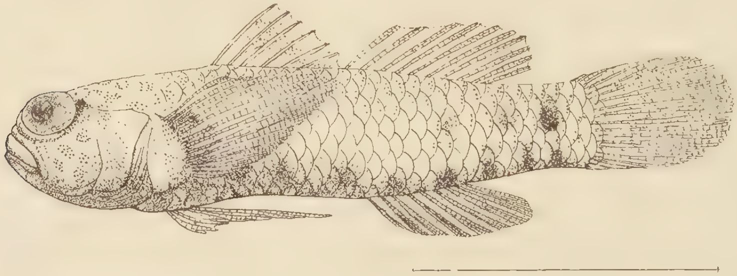

Fig. 78. *Eviota gymnocephalus* M. Weber × 4.

Teeth in several rows, outer row enlarged. Dorsal fins separate or nearly connected at their bases. First dorsal fin with 6 rays.

D. 2 I. 8-10; A. I. 7-9. Ventral fins long and narrow, the rays are fringed. Caudal fin rounded. Very small fishes.

Distribution: India to the Pacific, especially on coral reefs.

Note: The species of this genus are all of small size and are pretty difficult to distinguish. This genus needs a revision at the hand of a large material. In recent publication, Schultz, Bull. 180 U.S. Nat. Museum 1943, p. 247-248, p. 254-255, has given a revision of the species from the Samoan and Phoenix Islands of the specimens in the U.S. Museum. He distinguishes the species chiefly on colour-differences, neglecting in his key e.g. the number of scales, which is described by Jordan & Seale as different for species which Schultz regards to be synonyms. The following division is made after comparing specimens with the descriptions in literature. Only of *Eviota gymnocephalus,* M. Weber, the types have been studied.

Key to the Indo-Australian species of Eviota.

1. L.l. 28; D. 2 I. 10; A. I. 8. Six dark transverse bands on body. A crescent shaped blotch on caudal peduncle . . . . 1. *E. zonura* p. 317.
2. L.l. 22-25.
    A. L.l. 25; D. 2 I. 9; A. I. 8. Eight dark spots along ventral side of body. A dark dot on caudal peduncle . . . . 2. *E. gymnocephalus* p. 318.
    B. L.l. 24.
        a. D. 2 I. 8; A. I. 8. Two black spots on base of pectoral fin. . . . . 3. *E. distigma* p. 319.
        b. D. 2 I. 9; A. I. 7. A large black blotch before caudal fin, containing a light spot at its upper and lower part . . . . . . 4. *E. lachdeberei* p. 320.
        c. D. 2 I. 8; A. I. 6. Ventral part of body darker, especially on caudal peduncle . . 5. *E. nigriventris* p. 320.
    C. L.l. 22; D. 2 I. 8; A. I. 8. A dark spot on lower part of caudal peduncle . . . . . . 6. *E. prasites* p. 321.

1. **Eviota zonura** Jord. Seale.

?*Allogobius viridis* Waite, Rec. Austral. Mus. 5 prt. 3, 1904, p. 177, pl. 23 fig. 3.
Eviota zonura Jordan & Seale, Bull. Bur. Fisheries 25 (1905) 1906, p. 386, fig. 75.
Eviota zonura Kendall & Goldsborough, Mem. Mus. Comp. Zool. Harvard Coll. 26 no. 7, 1911, p. 317.
Eviota zonura Snyder, Proc. U.S. Nat. Mus. 42, 1912, p. 513.
Eviota zonura M. Weber, Siboga Exp. Fische 1913, p. 452.

?*Eviota viridis* Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 395.
Eviota zonura Koumans, Mem. Indian Mus. 13, 1941, p. 321.

D. 1 VI; D. 2 I. 10; A. I. 8; L.l. 28.

Body compressed, height 4.50 in length. Head 3.50 in length. Eye 3 in head. Mouth oblique, maxillary extends to below middle of eye. Teeth small. Dorsal fins scarcely connected at the bases. First dorsal fin a little lower than body. Second dorsal and anal fin lower than first dorsal fin. Pectoral fin and ventral fin longer than head. Caudal fin rounded, a little shorter than pectoral fin. Colour in spirits according to Jordan & Seale: "yellowish white, a distinct dark spot on caudal peduncle, three scales from base of caudal fin; six dusky bands extending a short distance vertically up from base of anal fin; these are usually darker at base of fin; shadings of dark spots on sides and top of head (this varies greatly and is absent in some specimens); caudal fin black; spinous dorsal at anterior base is white; the upper two-thirds and posterior base is black; soft dorsal shaded slightly with dusky; caudal with indications of many narrow vertical lines, the fins white." Length 20 mm.

Habitat: Sumba (reef near bay Malé Koba!); Flores (Pulu Serbete!); Savu. — India, Nicobars!, Japan (Okinawa), Samoa (Pago Pago, Apia), Paumotu Islands, ?Australia.

2. **Eviota gymnocephalus** M. Weber (Fig. 78, p. 316)

?*Eviota epiphanes* Jenkins, Bull. U.S. Fish Comm. 22, 1902 (1903) p. 501, fig. 42.
Eviota gymnocephalus M. Weber, Siboga Exp. Fische, 1913, p. 452, fig. 87.
Eviota gymnocephalus Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 72.
?*Eviota epiphanes* Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 395.
Eviota gymnocephalus Koumans, Mem. Indian Mus. 13, 1941, p. 320.

D. 1 VI; D. 2 I. 9; A. I. 8; P. 15; L.l. 25; L.tr. 7.

Body compressed, height $5^1/_2$ in total length. Head $4^3/_4$ in total length. Eye 3 or more than 3 in head. Snout $^1/_2$ eyediameter. Mouth oblique. Maxillary extends to below middle of eye. Teeth of outer row enlarged. Scales ctenoid, extending in front to middle of first dorsal fin, before this the scales are smaller and cycloid. Head and nape naked. Dorsal fins nearly connected at the bases. First dorsal fin lower than body, (in male?) the first ray is prolonged. Second dorsal and anal fin much lower than body. Caudal fin rounded, about as long as head. Pectoral fin about as long as head. Ventral fin a little longer. Colour yellowish. From base of the lower pectoral finrays to base of caudal fin about 8 transversal dark blotches, most distinct along ventral side of body, they may be absent. In middle of side before base of caudal fin a dark blotch. Head and nape with blotches which consist of dark points. Sometimes each scale at the back with one or a group of minute points. Anal fin dusky. Caudal fin with rows of dark points. Length 25 mm.

Habitat: Tanah Djampea!; Timor (east point); Kera near Timor!; Damar (Salomakië); Muaras reef; Kabala dua; Sulu Islands (Sanguisiapo); Celebes (Kwandang bay, Maratua!, Mamudju!); Island Siau; Talaud Islands (Beo!); Salibabu (Lirung); Saleyer, reef; Sula Besi (Banana); Obi latu!; Waigeu (northcoast). — India?, Andamans!, Honolulu?.

Types of *Eviota gymnocephalus* seen in the Amsterdam Museum.

3. **Eviota distigma** Jord. Seale

?*Asterropteryx abax* Jordan & Snyder, Proc. U.S. Nat. Mus. 24, (1902) 1901, p. 40, fig. 2.
Eviota distigma Jordan & Seale, Bull. Bur. Fisheries 25 (1905) 1906, p. 389, fig. 79.
Eviota distigma M. Weber, Siboga Exp. Fische 1913, p. 451.
Eviota distigma Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 395.
Eviota distigma Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 348.
?*Eviota abax abax* Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 46.
Eviota distigma Koumans, Mem. Indian Mus. 13, 1941, p. 320.

D. 1 VI; D. 2 I. 8; A. I. 8; L.l. 24.

Body compressed, height 4.10 in length. Head 3.10 in length. Eye 3.18 in head. Mouth rather small. Maxillary does not extend to below middle of eye. Teeth minute, sharp. First dorsal fin a little higher than body, first and second rays filiform. Second dorsal and anal fin lower than body. Pectoral and ventral fin a little longer than head. Caudal fin rounded, shorter than head. Colour in spirits according to Jordan & Seale: "yellowish white, with slight shading of dusky. The type specimen has two distinct round spots on base of pectoral, a black spot on side of caudal peduncle with an indistinct vertical band through it and around peduncle; two black spots above opercle; about 10 black blotches taking the form of short bands over the back, in some specimens extending indistinctly to ventral surface; 6 dusky band-like spots along base of anal and caudal peduncle; margin of the scales usually shaded with minute brown dots; opercle and nuchal region with brown blotches, some forming more or less irregular lines; the 2 dorsal fins about equally shaded with dusky; pectoral white; caudal, anal, and ventral with dusky shadings." Length 23 mm.

Habitat: Singapore; Postiljon Islands (Sarasa!); Celebes (Mamudju!, Bone Tambung near Makassar!); between Banda Neira and Gunung Api, ?Obi latu!. — India, Nicobars!, Japan?, Samoa (Pago Pago), Fiji, Tahiti.

4. **Eviota lachdeberei** Giltay

Eviota lachdeberei Giltay, Mem. Mus. Roy. Hist. Nat. Belgique Hors Serie 5 fasc. 3, 1933, p. 93, fig. 27.

D. 1 VI; D. 2 I. 9; A. I. 7; L.l. 24.

Body compressed, height 4 in length. Head 4 in length. Eye large, 2 in head, interorbital $^1/_2$ eyediameter. Mouth oblique. Maxillary extends to below anterior margin of pupil. First dorsal fin lower than body, first ray is the longest. Second dorsal and anal fin lower than first dorsal fin. Pectoral and ventral fin a little longer than head. Caudal fin rounded, a little shorter than head. Colour brownish, tail darker. A black blotch before base of caudal fin, containing a light spot at its upper and lower part. Scales with black border. A small, round, light spot on upper half of base of pectoral fin. Length 16 mm.

Habitat: Between Banda Neira and Gunung Api.

After Giltay, not seen by us.

5. **Eviota nigriventris** Giltay

Eviota nigriventris Giltay, Mem. Mus. Roy. Hist. Nat. Belgique Hors Serie 5 fasc. 3, 1933, p. 93, fig. 28.

D. 1 VI; D. 2 I. 8; A. I. 6; L.l. 24.

Body compressed, height $3^1/_2$ in length. Head 4 in length. Eye large, 2 in head, interorbital less than $^1/_3$ eyediameter. Snout short. Mouth oblique. Maxillary extends to below anterior border of eye. First dorsal fin lower than body, first ray is the longest. Second dorsal and anal fin lower than first dorsal fin. Pectoral fin as long as head. Ventral fin a little shorter. Caudal fin rounded, as long as head. Colour yellowish. The back is light, sides and ventral parts pigmented with dark. Lower part of caudal peduncle before caudal fin black. A light band from tip of snout to upper angle of opercle. Fins hyaline, except second dorsal and anal fin, which are pigmented with black. Length 14 mm.

Habitat: Between Banda Neira and Gunung Api.

After Giltay, not seen by us.

6. **Eviota prasites** Jord. Seale

Eviota prasites Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 387, fig. 76.
Eviota prasites M. Weber, Siboga Exp. Fische 1913, p. 451.

D. 1 VI; D. 2 I. 8; A. I. 8; L.l. 22.

Body elongate, compressed, height 4 in length. Head 3.20 in length. Eye $3\frac{1}{2}$ in head. Maxillary extends to below anterior part of pupil. Teeth small, sharp pointed. Anterior rays of first dorsal fin more or less prolonged, sometimes much longer than head, perhaps this prolongation is a character of the male. Second dorsal and anal fin about as high as body. Pectoral fin a little longer than head. Ventral fin as long as pectoral fin, or a little shorter. Caudal fin rounded, shorter than head. Colour in spirits according to Jordan & Seale: "yellowish white, the margin of the scales shaded with fine black dots; a distinct black spot at the posterior portion of caudal peduncle at base of caudal; usually a more or less distinct dusky blotch above this spot on the upper base of caudal; a black stripe from upper posterior part of opercle through eye and around snout; another black stripe around lower lip; a dusky blotch in upper axil of pectoral; darker shadings along the back, taking the form of more or less regular black spots along base of the dorsal; six indistinct dark band-like spots along the base of anal and under part of caudal peduncle; all the fins excepting the pectoral, which is white, have a dusky shading of fine dots; the spinous and soft dorsal have dark spots arranged in regular longitudinal lines, about four of these lines on the soft dorsal; caudal with five bands of dusky formed by separated dusky spots." Length 25 mm.

Habitat: Banda!. — Samoa (Pago Pago).

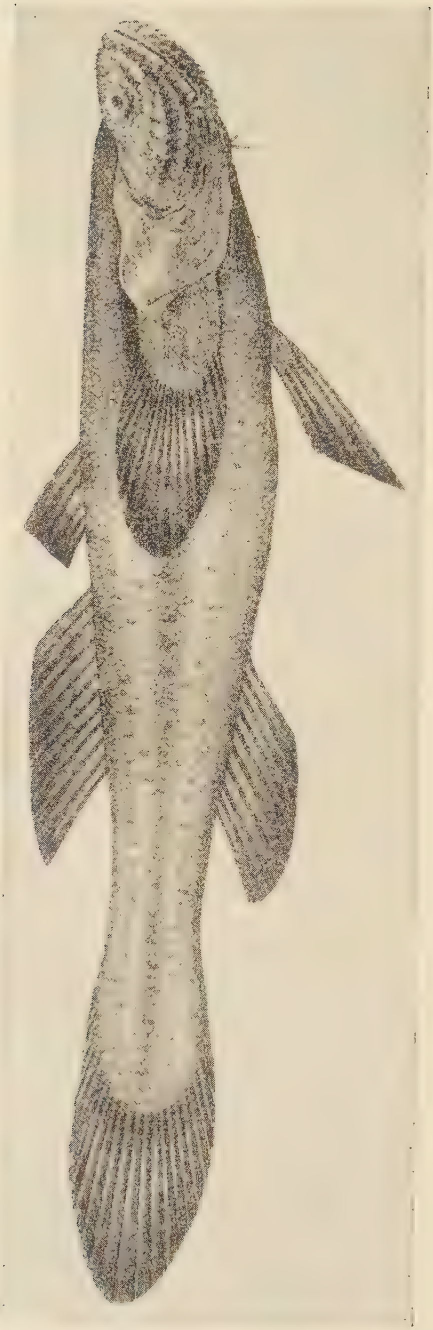

Fig. 79. *Pogoneleotris heterolepis* (Gthr.) × 5/6. After Vinciguerra.

8. **Pogoneleotris** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 107)

Body elongate, compressed, covered with about 54 ctenoid scales, intermixed with many smaller ones. Head broad, depressed, scaled above from behind the eyes. Opercle and upper half of cheek scaled. Snout and cheek with numerous short filaments, on lower side of head short papillae. Teeth in several rows, in upper jaw outer row enlarged, in lower jaw outer and inner row enlarged. No canines. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 11-12; A. I. 10. Caudal fin pointed.

Distribution: Borneo.

1. **Pogoneleotris heterolepis** (Gthr.) (Fig. 79, p. 322)

Eleotris heterolepis Günther, Ann. Mag. Nat. Hist. (4) 3, 1869, p. 445.
Pogoneleotris heterolepis Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 37.
Pogoneleotris heterolepis Vinciguerra, Ann. Mus. Civ. Genova 50 (3a Ser. 10), 1926, p. 543, pl. 1 figs. 1-4.

D. 1 VI; D. 2 I. 11-12; A. I. 10; P. 22; L.l. 54, intermixed with many smaller ones; L.tr.? 13; Predorsal scales ± 56 to interorbital.

Body elongate, compressed, height $5^1/_2$ in length, 7 in total length. Head broad, depressed, $3^1/_2$ in length, $4^1/_2$ in total length. Eye minute, 19-23 in head, interorbital 5-7 eyediameters, more than distance from eye to tip of snout. Snout 3-4 eyediameters, tip before middle of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below eye. Anterior nostril tubular. Teeth in a band. In upper jaw outer row enlarged, inner row feebly enlarged. In lower jaw outer and inner row enlarged. Gillopening a little continued forward below, isthmus moderate. Snout and cheek with numerous short filaments and fringes; on lower side of head like short papillae. Scales ctenoid, in anterior part of body cycloid. Scales with auxiliary scales at their bases. Head scaled with small scales, interorbital and snout naked. Head scaled above behind eye, on opercle and upper half of cheek. Second, third and fourth rays of first dorsal fin are the longest, half of height of body. Second dorsal and anal fin a little higher. Pectoral fin as long as postorbital part of head. Ventral fin as long as pectoral fin, inner rays are the longest. Caudal fin pointed, as long as head. Colour blackish brown. Length 275 mm.

Nom. indig.: Ikan buccat buttá (Sarawak).

Habitat: Borneo (Sarawak!, Moratabas!).

Type seen in British Museum (N.H.).

9. **Hypseleotris** Gill

(Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 270)

Asterropteryx Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 305 (not of Rüppell).
Giuris Sauvage, Bull. Soc. Philom. Paris 1879, p. 15.
Carassiops Ogilby, Proc. Linn. Soc. N.S. Wales 21, 1897, p. 732.
Caulichthys Ogilby, o.c. 22, 1898, p. 784.
Austrogobio Ogilby, o.c. 22, 1898, p. 788.

Body oblong, strongly compressed, covered with 23-32 ctenoid scales. Head compressed, scaled above and on cheek and opercle. Mouth small, oblique, lower jaw prominent. Teeth in both jaws in several rows, slender, outer row a little enlarged. No canines. Gill-openings continued forward below, isthmus narrow. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 9-11.

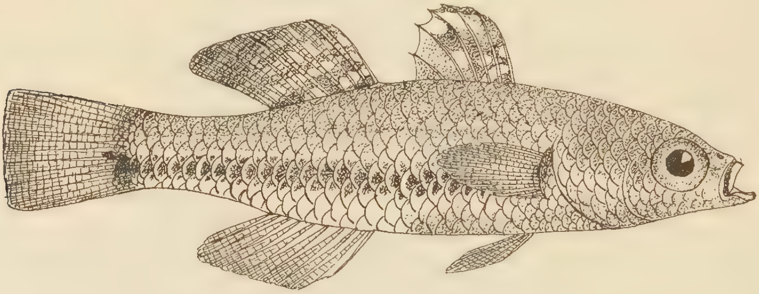

Fig. 80. *Hypseleotris güntheri* (Blkr.) × 2.

Distribution: From Indo-Australian Archipelago and Philippines to Australia and the islands of the South Pacific.

Key to the Indo-Australian species of Hypseleotris

1. 25 (28) scales in L.l. Height of body less than 4 in total length. First dorsal fin with blackish stripes. Second dorsal fin with yellow spots. D. 2 I. 9; A. I. 11; Predorsal scales 13 . . . . 1. *H. leuciscus* p. 325.

2 26-28 scales in L.l. Height of body 4 to more than 4 in total length.

- A. A blackish band from opercle to lower part of base of caudal fin, ending in a dark blotch. D. 2 I. 9; A. I. 9-10; Predorsal scales 15 . . . . 2. *H. güntheri* p. 326.
- B. No dark longitudinal band on body.
  - *a*. A blackish stripe from eye to throat. Dorsal fins black. First dorsal fin with white spot in middle of base and white part below tip. Second dorsal fin with 3 oblique white stripes. D. 2 I. 9 A. I. 10 . . . . 3. *H. taenionotopterus* p. 327.
  - *b*. No dark stripe from eye to throat.
    - *a'*. Predorsal scales 15. Body and fins without stripes or spots. D. 2 I. 9; A. I. 9 . . . . 4. *H. modestus* p. 328.
    - *b'*. Predorsal scales 15. Rays of second dorsal and caudal fin spotted. D. 2 I. 9; A. I. 9 . . . . 5. *H. cyprinoides* p. 328.
    - *c'*. Predorsal scales 19. Each scale of body with broad dark margin. Ventral fin blackish. Caudal fin with light spots. D. 2 I. 8; A. I. 10. 6. *H. moncktoni* p. 329.

1. **Hypseleotris leuciscus** (Blkr.)

Eleotris leuciscus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 278.
Eleotris leuciscus Günther, Cat. Fishes 3, 1861, p. 118.
Asterropteryx leuciscus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 79.

D. 1 VI; D. 2 I. 9; A. I. 11; P. 13; L.l. 25; L.tr. 8-9; Predorsal scales 13.

Body elongate, compressed, height $3^3/_4$ in total length. Head pointed, compressed, $4^1/_2$ in total length. Profile a little concave. Eye $3^1/_2$ in head, interorbital 1 eyediameter. Snout pointed, shorter than eye, tip before lower part of eye. Lower jaw prominent. Maxillary extends to before eye. Teeth in many rows, outer row enlarged. No canines. Supraopercular groove absent. Head scaled above from between the eyes and laterally. Scales of body ctenoid. First dorsal fin obtuse, half of height of body, rays weak, third ray is the longest. Second dorsal fin higher than the first, but lower than body, posteriorly pointed. Pectoral fin a little longer than head.

Ventral fin shorter than head without snout. Caudal fin obtuse, a little shorter than head. Colour anteriorly greenish red, posteriorly green, lighter below. First dorsal fin yellow, base and middle with blackish stripe, margin black. Second dorsal fin violet with yellow spots. Pectoral fin violet pink, base with double black and yellow spot. Other fins pink. Ventral and anal fin with black margin. Length 59 mm.

Habitat: Sumatra! (Priaman); Nias!. — In rivers.

Type seen in the Leiden Museum.

Note: A specimen from Nias, Kleiweg de Zwaan, in the Amsterdam Museum, of 50 mm, shows height of body 3-3$^1/_2$ in length, 3$^3/_4$-4 in total length. Head 3$^3/_4$-4 in length, 4$^1/_2$ in total length. Scales in L.l. about 28.

2. **Hypseleotris güntheri** (Blkr.) (Fig. 80, p. 324)

Eleotris cyprinoides Günther, Cat. Fishes 3, 1861, p. 118 (not of C.V.).

Asterropteryx Güntheri Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 112.

Eleotris guentheri Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 186, pl. 113 fig. A.

Hypseleotris guntheri Jordan & Seale, Bull. Bur. Fish. 25, (1905) 1906, p. 385, fig. 74.

Carassiops cyprinoides var. *güntheri* M. Weber & De Beaufort in Sarasin & Roux, Nova Caledonia Zool. 2 Livr. 1 no. 2, 1915, p. 35.

Hypseleotris güntheri Herre, Field Mus. Nat. Hist. Zool. 21, 1936, pp. 342, 450.

Hypseleotris cyprinoides Schultz, Bull. 180 U.S. Nat. Mus. 1943, p. 245, 249, (not of C.V.).

D. 1 VI; D. 2 I. 9; A. I. 9-10; P. 14; L.l. 26-28; L.tr. 8; Predorsal scales 15.

Body compressed, 4-4$^1/_2$ in length, 5 in total length. Head 4 in length, 5 in total length, anteriorly cylindrical, posteriorly compressed. Profile straight. Eye 3-3$^1/_2$ in head, interorbital $^3/_4$-1 eyediameter. Snout pointed, shorter than eye, tip before middle of eye. Lower jaw prominent. Mouth narrow. Maxillary does not reach eye. Teeth in several rows, outer row enlarged. Tongue slightly emarginate. Head totally scaled, except anteriorly on snout. First dorsal fin low, second ray is the longest. Fins further as in *H. modestus*. Colour yellowish. A black band from opercle to lower part of base of caudal fin, ending in a dark blotch. Rays of second dorsal and caudal fin spotted. Pectoral fin with dark spot at upper part of base. First dorsal fin with dark longitudinal band halfway. Anal fin with dark margin. Length 78 mm.

Habitat: Sumatra (Padang!); Mentawei Islands (Sibirut!); New Guinea (Sepik river). — Oualan!, Savaii, Fiji Islands, Samoa, New Caledonia (Oubatché!).

Type of *Eleotris cyprinoides* Gthr. from Oualan seen in British Museum (N.H.).

Note: A specimen of 78 mm from Oubatché, New Caledonia, has the tip of the snout scaled. Predorsal scales about 16.

3. **Hypseleotris taenionotopterus** (Blkr.)

Eleotris taenionotopterus Bleeker, Nat. Tijdschr. Ned. Indië 12, 1856-1857, p. 298.
Eleotriodes taenionotopterus Bleeker, o.c. 14, 1857, p. 465.
Eleotris taenionotopterus, Günther, Cat. Fishes, 3, 1861, p. 118.
Asterropteryx taenionotopterus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 80.

D. 1 VI; D. 2 I. 9; A. I. 10; P. 14; L.l. 28; L.tr. 8.

Body elongate, compressed, height more than 4 in total length. Head pointed, compressed, $4^1/_4$ in total length. Profile a little concave. Eye $3^2/_3$ in head, interorbital 1 eyediameter. Snout shorter than eye, tip before middle of eye. Lower jaw prominent. Maxillary extends to below anterior margin of eye, or not so far. Teeth in several rows, outer row enlarged. No canines. Supraopercular groove indistinct. Head scaled laterally and above? Scales of body ctenoid. First dorsal fin pointed, more than half of height of body, second and third rays are the longest. Second dorsal fin obtuse, less than half of height of body. Pectoral and ventral fin rounded, shorter than head without snout. Anal fin lower than second dorsal fin. Caudal fin rounded, not shorter than head without snout. Colour reddish green above, lighter below. A broad dusky stripe from eye to throat. Dorsal fins black. First dorsal fin with white spot in middle of base and white part under tip. Second dorsal fin with 3 oblique white stripes. Pectoral fin pink, base with violet transverse stripe. Ventral and anal fin pink. Anal fin dusky below. Caudal fin orange pink at the base, middle and margin dusky. Length 53 mm.

Habitat: Bali (Boleleng!). — Philippines!. — In rivers.

Types seen in the Leiden Museum.

4. **Hypseleotris modestus** (Blkr.)

Eleotris cyprinoides Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 277 (not of C.V. and Gthr.).

Asterropteryx modestus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 111. — Versl. Ak. Amsterdam (2) 11, 1877, p. 81.

D. 1 VI; D. 2 I. 9; A. I. 9; P. 14; L.l. 28; L.tr. 8; Predorsal scales 15.

Body elongate, compressed, height 4-4$^1/_2$ in total length. Head pointed, compressed, 4$^2/_5$-4$^3/_4$ in total length. Profile straight to a little concave. Eye 3-3$^1/_2$ in head, interorbital less than 1 eye-diameter. Snout a little pointed, shorter than eye, tip before middle of eye. Lower jaw prominent. Maxillary extends to before eye. Teeth in several rows, outer row enlarged. No canines. Supraopercular groove indistinct. Head scaled above from between the eyes and laterally. Scales of cheek and above on head cycloid, those of opercle and body ctenoid. First dorsal fin obtuse, more than half of height of body, rays weak, second and third rays are the longest. Second dorsal fin obtuse, a little higher than the first, pointed posteriorly. Pectoral fin obtusely rounded, not longer than head without snout. Ventral fin a little shorter. Anal fin a little lower than second dorsal fin. Caudal fin obtusely rounded, a little shorter than head. Colour reddish green above, lighter below. No stripe from head to caudal. Fins reddish yellow to yellow, without stripes or spots. Pectoral fin with dusky transverse stripe on base. Length 62 mm.

Habitat: Singapore; Sumatra (Benkulen); Java (Dirk de Vries bay!). — In rivers and estuaries.

Specimens of Bleeker's collection seen in the Leiden Museum.

Note: The specimens stated by Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 81, fig. 20 from Padang bay, Bali, probably do not belong to this species, as the dorsal fins show stripes in the figure.

5. **Hypseleotris cyprinoides** (C. V.)

Eleotris cyprinoides Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 248.

?*Hypseleotris modestus* Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 130, fig. 4.

The type specimen of *Eleotris cyprinoides* C.V. from St. Maurice, Leschenault, in the Paris Museum, shows height of body $4^1/_4$ in length, $5^1/_2$ in total length. Head $3^4/_5$ in length, $4^2/_3$ in total length. Rays of second dorsal and caudal fin spotted. The further characters agree with those of *H. modestus* (Blkr.).

Habitat: ?Celebes (Boloang). — St. Maurice!.

6. **Hypseleotris moncktoni** (Regan)

Eleotris (Caulichthys) moncktoni Regan, Ann. Mag. Nat. Hist. (8) 1, 1908, p. 156.

D. 1 VI; D. 2 I. 8; A. I. 10; P. 14?; L.l. 29; L.tr. 8; Predorsal scales 19-20.

Body compressed, $3^2/_3$ in length. Head 4 in length. Profile straight. Eye 4 in head, interorbital more than 1 eyediameter. Mouth narrow, lower jaw prominent. Maxillary extends to before eye. Head totally scaled. First dorsal fin low, second ray is the longest. Colour: each scale of body has a broad dark brown margin. The dark edges of the scales form a narrow blackish bar on base of pectoral fin. Ventral fin blackish. Caudal fin with small light spots. Length 73 mm.

Habitat: British New Guinea (Agajambo!).

Type seen in British Museum (N.H.).

Note: The species is very close to *H. güntheri*, but distinct.

10 **Odonteleotris** Gill

(Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 270)

Body elongate, anteriorly cylindrical, posteriorly compressed, covered with 45-100 scales, at least anteriorly cycloid. Head depressed, scaled, except on snout. Mouth oblique, lower jaw prominent. Teeth in several rows, in front on each side 2-4 canines in upper jaw. In lower jaw inner row enlarged laterally. Isthmus broad. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 9-11; A. I. 8-9.

Distribution: India to Australia.

Key to the Indo-Australian species of Odonteleotris

A. L.l. 45; L.tr. ± 16. Eye 4 in head, interorbital $^2/_3$ eyediameter . . . . 1. *O. nesolepis* p. 330.
B. L.l. ± 70; L.tr. ± 20. Eye $4^1/_2$-5 in head, interorbital 1, or more than 1 eyediameter . . . . . 2. *O. canina* p. 331.
C. L.l. 90; L.tr. 30. Eye 8 in head, interorbital 3 eyediameters . . . . 3. *O. macrodon* p. 331.

1. **Odonteleotris nesolepis** M. Weber

Eleotris (Odontoeleotris) nesolepis M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 256.
Odontoeleotris nesolepis Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 389.

D. 1 VI; D. 2 I. 11; A. I. 8-9; P. 14; L.l. 45; L.tr. ± 16; Predorsal scales ± 22.

Body elongate, compressed, height $5^1/_2$-6 in length, 6-7 in total length. Head depressed, $3^1/_2$-$3^3/_4$ in length, $4^1/_2$ in total length. Profile straight to concave. Eye 4 in head, interorbital $^2/_3$ eyediameter. Snout obtuse, as long as eye, tip before middle of eye. Anterior nostril in a short tube. Mouth oblique, lower jaw scarcely prominent. Maxillary extends to below anterior half of eye. Teeth in several rows, in upper and lower jaw about 8 caninoid teeth in outer row. A number of short mucous canals radiate under eye, 2 longitudinal canals on cheek. Head scaled from between the eyes and in 2-3 rows on upper part of opercle. Scales in interorbital space and nape larger than those behind these regions. Scales posteriorly on body ctenoid, anteriorly cycloid. Height of second dorsal fin is $^2/_3$ of height of body. Pectoral fin a little pointed, about as long as head without snout. Ventral fin shorter than head without snout.

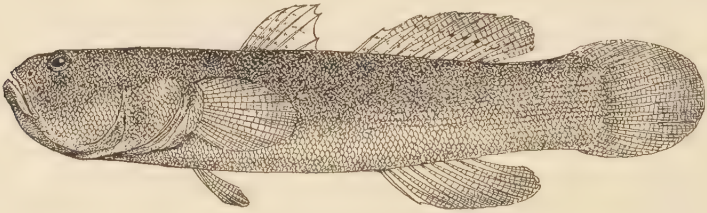

Fig. 81. *Odonteleotris macrodon* (Blkr.). n.s.

Caudal fin rounded, about as long as head. Colour yellowish brown above. The lighter lower part is separated from the darker upper part by a dark longitudinal band. Upper part of body with 7-8 indistinct dark transverse bands. A dark band from snout below eye to opercle, a similar, but more indistinct band below it. Scales of body with dark margins. Dorsal fins and upper half of caudal fin with rows of dark spots. Length 50 mm.

Habitat: New Guinea (Tawarin river!, Timena river!). — In freshwater.

Types seen in the Amsterdam Museum.

2. **Odonteleotris canina** (Blkr.)

Eleotris canina Bleeker, Verh. Bat. Gen. 22, 1849, p. 20.
Eleotris canina Günther, Cat. Fishes 3, 1861, p. 124.
Odonteleotris canina Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 18.
Odonteleotris canina Herre, Bull. Raffles Mus. 16, 1944, p. 49.

D. 1 VI; D. 2 I. 9; A. I. 8; P. 15; L.l. ± 70; L.tr. ± 20; Predorsal scales ± 40.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 6 in total length. Head pointed, depressed, 4 in total length. Frontal profile straight. Eye $4^1/_2$-5 in head, interorbital 1 or more than 1 eyediameter. Snout pointed, tip before middle of eye. Anterior nostril near margin of snout, in a short tube. Lower jaw prominent. Maxillary extends to below middle of eye. Teeth pointed, curved, in some rows. Outer row in upper jaw distant, in upper jaw on each side 1 canine. In lower jaw on each side 2 canines on the outer side of the rows of small teeth. Scales on head minute. First dorsal fin lower than body. Second dorsal and anal fin a little higher than first dorsal fin. Pectoral fin obtuse, longer than postorbital part of head. Caudal fin obtuse, about as long as head without snout. Colour green above, yellow below. Fins reddish to yellowish? Length 72 mm.

Habitat: Surabaja and Kammal in Strait Madura!; Singapore.

Types seen in the Leiden Museum.

3. **Odonteleotris macrodon** (Blkr.) (Fig. 81, p. 330)

Eleotris macrodon Bleeker, Verh. Bat. Gen. 25, 1853, p. 104, pl. 2 figs. 1, 1a, 1b.
Eleotris macrodon Günther, Cat. Fishes 3, 1861, p. 129.

Eleotris macrodon Day, Fishes India 1878, p. 311, pl. 65 fig. 5. — Fauna Brit. India Fishes 2, 1889, p. 292.
?*Eleotris macrodon* Klunzinger, Sitz. ber. Ak. Wiss. Wien 80, 1880, p. 385.
Eleotris macrodon M. Weber & De Beaufort in Kleiweg de Zwaan, Die Insel Nias bei Sumatra, 1915, p. 272.
Odonteleotris macrodon Koumans, Mem. Indian Mus. 13, 1941, p. 328.

D. 1 VI; D. 2 I. 9-10; A. I. 8; P. 17; L.l. 90; L.tr. 30; Predorsal scales 60.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5 in length, 6 in total length. Head a little depressed, $3^1/_2$-$3^3/_4$ in length, $4^1/_2$ in total length. Profile between the eyes a little concave. Eye 8 in head, interorbital 3 eyediameters. Snout rounded, less than 2 eyediameters, tip before upper part of eye. Anterior nostril tubular. Maxillary extends to below posterior part of eye. Teeth in several rows. In upper jaw outer row with 4-6 canines, inner row behind symphysis with a curved canine, in the type very weak. In lower jaw outer row with 4 canines. Four mucous canals radiate under eye, crossed by 2 longitudinal canals on cheek. Above eye some short radiating canals, on each side from snout to interorbital a longitudinal canal. On lower side of head many short transverse canals along ramus of lower jaw. On chin on each side a longitudinal canal. Some (about 3) open pores on each side in interorbital round the eye. Head scaled, except on snout. Scales cycloid. First dorsal fin low, height less than half of height of body, third and fourth rays are the longest. Second dorsal and anal fin higher than body, pointed posteriorly. Pectoral fin as long as postorbital part of head. Ventral fin a little shorter. Caudal fin obtuse, $^2/_3$ of head. Colour blackish green above, pink below. Two to four black stripes radiate on cheek from eye. Rays of dorsal fins and caudal fin spotted, membrane violet. Ventral fin anteriorly with red margin. Anal fin with red margin. Caudal fin above at the base with red spot. Length 134 mm.

Habitat: East part of Java!; Nias (Lahewa!); Celebes (Paré Paré!). — Calcutta in river Hooghly!, Akyab!, Malaya (Teluk Anson in Lower Perak!), Port Darwin?

Type seen in the Leiden Museum.

11. **Eleotriodes** Bleeker

(Bleeker, Nat. Tijdschr. Ned. Indië 15, 1858, p. 212)

Valenciennea Bleeker, Nat. Tijdschr. Ned. Indië 11, 1856, p. 412 (nomen nudum).

Calleleotris Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 270.
Valenciennesia Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 307. — Versl. Ak. Amsterdam (2) 8, 1874, p. 372.
Gergobius Whitley, Mem. Queensland Mus. 10 prt. 1, 1930, p. 22.

Body elongate, compressed, covered with 70-130 ctenoid scales. Head obtuse, naked. Nostrils not tubular. Jaws subequal. Teeth in upper jaw in one row, in front canninoid, sometimes rudimentary inner rows of teeth. In lower jaw teeth in more rows, outer row curved canines. Gillopenings not continued forward below, isthmus broad. Dorsal fins subcontinuous. First dorsal fin with 6 rays. D. 2 and A. I. 11-19. Caudal fin obtuse to lanceolate.

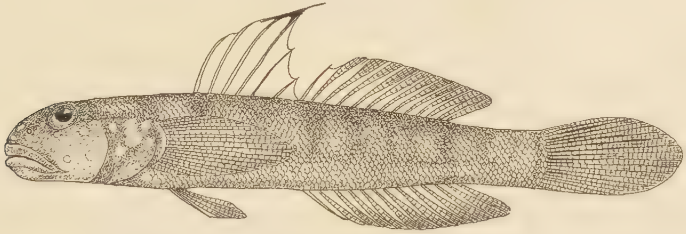

Fig. 82. *Eleotriodes sexguttatus* (C.V.) × 1½.

Distribution: Red Sea and India to the Pacific.

Key to the Indo-Australian species of Eleotriodes

1. D. 2 and A. I. 16-18; L.l. ± 105. Caudal fin rounded. Head with pearl like streak from maxillary below eye to opercle. . . . . . . 1. *E. strigatus* p. 334.
2. D. 2 and A. I. 11-13.
   A. More than 100 scales in L.l.; 35 in L.tr.
      a. L.l. ± 130. Caudal fin with the middle rays prolonged in fila. Two longitudinal violet stripes on body. First dorsal fin with blackish stripe near tip . . . . . 2. *E. helsdingenii* p. 335.
      b. L.l. ± 105. Caudal fin lanceolate. Body without longitudinal stripe, but with oblong spots and transverse bands. First dorsal fin with red stripes . . . . 3. *E. longipinnis* p. 336.
   B. 85-95 scales in L.l.; 22-25 in L.tr.
      a. Cheek, opercle and dorsal fins with red longitudinal stripes . . . . 4. *E. muralis* p. 337.
      b. Cheek with 2-3 rows of blue spots, bordered by violet. First dorsal fin with many spots. Second dorsal fin with longitudinal streaks . . . . 5. *E. sexguttatus* p. 339.

1. **Eleotriodes strigatus** (Brouss.)

Gobius strigatus Broussonet, Dec. Ichth. 1, 1782, p. 1, pl. 1.
Gobiomorus taiboa Lacépède, Hist. Nat. Poissons 4, 1800, p. 410.
Eleotris strigata Bloch ed. Schneider, Syst. Ichth. 1801, p. 65.
Eleotris strigata Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 251.
Eleotris strigata Bleeker, Act. Soc. Ind. Neerl. 1, 1856, p. 48.
Valenciennea strigata Bleeker, Nat. Tijdschr. Ned. Indië 11, 1856, p. 412.
Eleotriodes strigatus Bleeker, o.c. 15, 1858, p. 212.
Eleotris strigata Günther, Cat. Fishes 3, 1861, p. 131.
Calleleotris strigata Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 270.
Valenciennesia strigata Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 89.
Eleotris strigata Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 190, pl. 111 fig. E.
Valenciennea strigata Evermann & Seale, Bull. Bur. Fish. 26, (1906) 1907, p. 104.
Eleotris (Valenciennesia) strigata M. Weber, Siboga Exp. Fische 1913, p. 449.
Valenciennea strigata Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 78.
Valenciennea strigatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 396.

D. 1 VI; D. 2 I. 17-18; A. I. 16-18; P. 21-22; L.l. ± 105; L.tr. 35.

Body elongate, compressed, height $4^1/_2$-5 in length, 6-$6^1/_2$ in total length. Head obtuse, convex, compressed, $3^1/_4$-$3^1/_2$ in length, 4-$4^3/_5$ in total length. Eye 4-$4^1/_2$ in head, interorbital $^2/_3$-1 eyediameter. Snout obtuse, convex, not longer than eye, tip before or a little below lower margin of eye. Jaws subequal. Maxillary extends to below middle of eye, or not so far. Teeth pointed, curved. In upper jaw teeth in one row, on each side 2-4 canines. In lower jaw teeth in one row, only near symphysis sometimes in two rows; in front on each side 4-6 teeth a little enlarged, on each side laterally of them 1-2 curved canines. Supraopercular groove not very distinct. Three to four open pores along posterior margin of preopercle. Two open pores medially in interorbital space, an open pore medially of anterior nostril, some open pores behind eye. A mucous canal under eye. Head and median part of nape naked, scales of nape laterally very small. Scales of body ctenoid, growing larger towards caudal. Dorsal fins subcontinuous. First dorsal fin lower than body, second and third rays prolonged. Dorsal and anal fin half of height of body, posteriorly pointed. Pectoral fin obtuse, rounded. Pectoral and ventral fin about as long as head without snout. Caudal fin obtusely rounded, about as long as head. Colour greenish red above, orange below, belly pearl like. A pearl like streak, bordered with black, from maxillary under eye to upper margin of opercle. A similar, but shorter and oblique streak on lower part of cheek and on suboperculum. Behind eye a small pearl like spot, bordered with black. Laterally on body 4-5 red stripes from head to caudal, the last one is preceded by a round pearl like spot. Fins weakly orange to red. On dorsal fins halfway 3-4 longitudinal red streaks. Base of pectoral fin with pearl coloured transverse streak, bordered with violet. Upper and lower part of caudal fin with red, curved streaks, which converge posteriorly. Inner side of mouth black. Length 130 mm.

Habitat: Singapore; Java (Karangbollong); Flores (Larantuka); Pulu Serbete!; Solor (Lawajong); Timor! (east part!); Kisser!; Celebes (Menado, Mamudju!); Binongka!; Salibabu (Lirung!); Buru (Kajeli); Nusa Laut!; Ambon!; Haruku!; Banda!; Tiur!; Misol. — Philippines, New Hebrides, Tahiti, Fiji, Samoa!, Society Islands, Christmas Island!, Woodlark, Lindeman Island. — In sea.

2. **Eleotriodes helsdingenii** Blkr.

Eleotriodes Helsdingenii Bleeker, Nat. Tijdschr. Ned. Indië 15, 1858, p. 212.
Eleotris helsdingenii Günther, Cat. Fishes 3, 1861, p. 131. — Brenchley's Cruise of the "Curaçoa" 1873, p. 411.
Valenciennesia Helsdingenii Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 91.
?*Eleotris Helsdingenii* Meyer, Ann. Soc. Esp. Hist. Nat. 14, 1885, p. 30.
Eleotriodes helsdingenii Smith & Pope, Proc. U.S. Nat. Mus. 31, (1906) 1907, p. 489, fig. 9.
Eleotriodes helsdingenii Jordan, Tanaka & Snyder, Journ. Coll. Sci. Univ. Tokyo 33 art. 1, 1913, p. 338, fig. 288.

D. 1 VI; D. 2 I. 11; A. I. 11; P. 23-24; L.l. 130; L.tr. 35.

Body elongate, compressed, height 7 in total length. Head acute, convex, compressed, $4^1/_4$-$4^1/_3$ in total length. Eye $4^3/_4$-5 in head, interorbital $^4/_5$ eyediameter. Snout obtuse, a little longer than eye, tip before or a little below inferior margin of eye. Jaws equal. Maxillary extends to below middle of eye. Teeth conical, curved. In upper jaw in one row, anteriorly on each side 4 canines. In lower jaw teeth anteriorly in two rows, laterally in one row; on each side anteriorly 6 enlarged teeth of outer row, laterally of them a curved canine. Supraopercular groove not distinct. Head naked, median part of nape naked, scales laterally on nape very small. Scales of body deciduous, weakly ctenoid, the scales become larger towards caudal. Dorsal fins subcontinuous. First dorsal fin lower than body, second, third and fourth rays are the longest. Second dorsal and anal fin anteriorly lower than first dorsal fin, posteriorly higher, about as high as body. Pectoral fin obtuse, about as long as head without snout. Ventral fin a little shorter. Caudal fin rounded, the 5 middle rays are the longest, the upper and lower of them filiform. Caudal fin without the prolonged rays about as long as head without snout. Colour reddish green above, reddish pearl like below. Two longitudinal violet stripes on body, the upper from snout to eye to the upper caudal filum, the lower from maxillary over suboperculum and base of pectoral fin to lower caudal filum. First dorsal fin reddish, at the tip a broad longitudinal blackish stripe, bordered with yellow. Second dorsal fin reddish, bordered above with dark violet, below the margin a yellow stripe. Ventral and anal fin yellow. Caudal fin reddish yellow, bordered above and below with dark violet. Length without caudal fila 155 mm, with caudal fila 170 mm.

Habitat: ?North Celebes; Ambon!; Goram!; Misol. — Japan (Urado, Kochi). — In sea.

Type seen in the Leiden Museum.

3. **Eleotriodes longipinnis** (Benn.)

Eleotris longipinnis Bennett, Zool. Voy, Beechey Fishes 1839, p. 64, pl. 20 fig. 3.
Eleotris ikeineur Montrouzier = *E. strigata* Thiollière (not of Val), Ann. Sc. Phys. et Nat. Soc. Imp. d'Agric. Lyon (2) 8, 1856, p. 466.
Eleotris longipinnis Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 190.
Valenciennesia longipinnis Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 93.
Eleotris taeniura Macleay, Proc. Linn. Soc. N.S. Wales 5, 1881, p. 624.
Valenciennia longipinnis Waite, Rec. Austral. Mus. 4, 1902, p. 271, pl. 43.
Eleotris (Valenciennesia) longipinnis M. Weber, Siboga Exp. Fische 1913, p. 449.
Valenciennea longipinnis McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 263.
Valenciennea longipinnis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 76, pl. 6 fig. 1.
Valenciennea longipinnis Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 397.
Calleleotris (Gergobius) taeniura Whitley, Mem. Queensland Mus. 10 prt. 1, 1930, p. 22.
Calleleotris longipinnis Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 49.

D. 1 VI; D. 2 I. 12-13; A. I. 12; P. 19-20; L.l. 105; L.tr. 35.

Body elongate, compressed, height 5-5$^1/_2$ in length, 6-7 in total length. Head obtuse, compressed, 3$^1/_4$-3$^3/_4$ in length, 4$^1/_4$-5 in total length. Eye 4-5 in head, interorbital $^1/_2$-1 eyediameter. Snout obtuse about as long as eye to $1^1/_2$ eyediameter, tip below inferior margin of eye. Jaws equal. Maxillary extends to below middle or posterior part of eye. Teeth conical, curved. In upper jaw in one row, in front on each side 4-5 caninoid teeth. In lower jaw teeth in front in two rows, laterally in one row, in front in outer row 5-6 enlarged teeth, laterally of them 1-2 curved canines, inner row in front 3-4 enlarged teeth. Supraopercular groove not very distinct. Open pores as in *E. strigatus*. Head and median part of nape naked, lateral scales of nape very small. Scales of body ctenoid, becoming larger towards caudal. Dorsal fins subcontinuous. First dorsal fin obtuse, lower than, to about as high as body, third, fourth and fifth rays are the longest. Second dorsal and anal fin anteriorly lower than first dorsal fin, posteriorly higher. Pectoral fin obtuse, longer than head without snout. Ventral fin shorter. Caudal fin in young specimens obtuse, in adult lanceolate, longer than head. Colour reddish green above, light to reddish pearl like below. On each side of head laterally 4 longitudinal red bands: the uppermost from snout to eye, the other ones from maxillary to opercle, these bands are undulated posteriorly and ascend a little. On lower part of cheek and opercle 1-3 red spots. On nape 5 rows of oblong spots, sometimes coalized to longitudinal streaks. On body above 4 longitudinal dark orange oblong spots to bands, crossed by 8-9 spots or bands of the same colour, which become red below. On lower part of body 5 dark orange ocelli, bordered with red; these ocelli are continued backwards as club-shaped transverse bands, the first behind axilla, second above insertion of anal fin, fifth at the base of caudal fin. Fins yellow to orange. First dorsal fin with 6 oblique red stripes. Second dorsal fin with 3 longitudinal rows of red ocelli. Anal fin halfway with oblique red stripe. Caudal fin with 2 rows of horseshoe like red ocelli. Inner side of mouth black to dark. Length 165 mm.

Habitat: Samau (Hainsisi reef!); Solor (Lawajong); Sulu Islands (Sanguisiapo!); Celebes (Menado); Buru (Kajeli); Ambon. — Philippines, Lew Chew Archipelago, Riu Kiu Islands, Woodlark Islands, New Caledonia?, Fiji Islands, Samoa, Queensland. — In sea.

4. **Eleotriodes muralis** (Q.G., C.V.)

Eleotris muralis (Quoy & Gaimard) Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 253, pl. 357.

Eleotris trabeatus Richardson, Icones Piscium 1843, p. 5, pl. 2 fig. 2.
Eleotris muralis Bleeker, Nat. Tijdschr. Ned. Indië 1, 1850, p. 254.
Eleotriodes muralis Bleeker, o.c. 14, 1857, p. 465.
Eleotris muralis Günther, Cat. Fishes 3, 1861, p. 130.
Eleotris lineato-oculatus Kner, Sitz. ber. Ak. Wiss. Wien 56, 1867, p. 720, pl. 3 fig. 1.
Eleotris muralis Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 789.
Valenciennesia muralis Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 96.
Eleotris muralis Day, Fishes India 1878, p. 312, pl. 69 fig. 1. — o.c. Suppl. 1888, p. 794. — Fauna Brit. India Fishes 2, 1889, p. 290.
Eleotris muralis Sauvage, Bull. Soc. Philom. Paris (7) 6, 1882, p. 172.
Eleotris caledonicus Sauvage M.S. name?
Valenciennea muralis Jordan & Snyder, Proc. U.S. Nat. Mus. 24, 1901, p. 42.
Valenciennea aruensis Ogilby, Proc. Roy. Soc. Queensland 23, 1910, p. 21.
Valenciennea muralis McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 261, pl. 37 fig. 4.
Valenciennea muralis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 79.
Valenciennea muralis Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 397.
Calleleotris (Gergobius) muralis Whitley, Rep. Brit. Mus. (N.H.) 4 no. 9, 1932, p. 300.
Valenciennea muralis Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 350.
Valenciennea muralis, Fowler, Hongkong Naturalist Suppl. 6, 1938, p. 41, fig. 4.
Valenciennea aruensis Koumans, Zool. Meded. Leiden 22, 1940, pp. 164, 175 (as synonym).
Eleotriodes muralis Koumans, Mem. Indian Mus. 13, 1941, p. 326.

D. 1 VI; D. 2 I. 12; A. I. 12; P. 19-20; L.l. 85-95; L.tr. 25.

Body elongate, compressed, height $5^1/_2$ in length, 7-9 in total length. Head obtuse, compressed, $3^1/_2$ in length, $4^1/_2$-5 in total length. Eye 4-5 in head, interorbital $^1/_2$-$^2/_3$ eyediameter. Snout obtuse, convex, longer than eye, tip before or a little below inferior margin of eye. Jaws equal. Maxillary extends to below anterior half of eye. Teeth conical; in upper jaw in one row, on each side 3-5 caninoid teeth in front. In lower jaw teeth in front in two rows, laterally in one row, in front on each side 5-6 enlarged teeth of outer row, laterally of these teeth a curved canine, inner row in front with 3-7 enlarged teeth. Supraopercular groove not very distinct. Open pores as in *E. strigatus.* Head and median part of nape naked, scales laterally on nape very small. Scales of body ctenoid, becoming larger towards caudal. Dorsal fins subcontinuous. First dorsal fin about as high as, or a little lower than body, third and fourth, sometimes second, third and fourth rays are the longest, a little prolonged beyond the membrane. Second dorsal and anal fin anteriorly lower than body, posteriorly higher than body.

Pectoral fin obtuse, longer than head without snout. Ventral fin shorter than head without snout. Caudal fin in young specimens rounded, a little longer than head, in adult obtusely pointed. Colour greenish red above, lighter to pearl like red below. Head on each side with 3 oblique adscendent stripes. Body with 3 longitudinal red stripes, the uppermost near dorsal profile, the undermost from axilla to caudal. Fins yellow to orange. First dorsal fin with many oblique red stripes, tip most with small black spot. Second dorsal fin on basal half with 2 longitudinal red bands, outer half with many transverse oblong red spots. Base of pectoral fin most with irregular red blotch. Anal fin with red basal stripe. Caudal fin with red ocelli, irregularly placed. Inner side of mouth black. Length 170 mm.

Nom. indig.: Kebus, Niki (Menado), Nike, Duwang (Batjan).

Habitat: Singapore, Pulu Brani!; Banka (Muntok); Sumatra (Priaman); Java (Bay of Djakarta!); Madura (Pamekasan!); Sapudi sea!; Bawean; Flores (Larantuka!); Solor Islands!; Timor!; (Kupang); Borneo (Bontang reef!); Sulu Islands (Sitankai); Celebes (Menado, Mamudju!); Morotai!; Batjan (Labuha); Ceram (Wahai); Ambon; Goram; Kei Islands!; Aru Islands (Dobo!). — India!, Ceylon, Sembilan Islands (Pulu Lalang!), Siam, Hongkong, Japan, Philippines, Melanesia, Polynesia, Micronesia, N.W. Australia, Queensland. — In sea.

Type of *Eleotris caledonicus* seen in Paris Museum, type and cotype of *Valenciennea aruensis* seen in Queensland Museum, Brisbane and in Australian Museum, Sydney.

5. **Eleotriodes sexguttatus** (C.V.) (Fig. 82, p. 333)

Eleotris sexguttatus Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 254.

Eleotris sexguttata Bleeker, Nat. Tijdschr. Ned. Indië 1, 1850, p. 253. — Act. Soc. Sc. Indo-Neerl. 3, 1858, p. 42.

Eleotriodes sexguttata Nat. Tijdschr. Ned. Indië 13, 1857, p. 372.

Eleotris sexguttata Günther, Cat. Fishes 3, 1861, p. 130.

Valenciennesia sexguttata Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 98.

Eleotris sexguttata Day, Fishes India 1878, p. 311. — Fauna Brit. India Fishes 2, 1889, p. 291.

Valenciennea violifera Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906. p. 383, pl. 52 fig. 2.

Eleotris (Valenciennesia) sexguttata M. Weber, Siboga Exp. Fische 1913, p. 450.

Valenciennea violifera Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 80.
?*Eleotris wardii* Fowler & Bean, Proc. U.S. Nat. Mus. 71 art. 10, (1927) 1928, p. 10 (not of Playfair?).
Valenciennea violifera Koumans, Zool. Meded. Leiden 22, 1940, p. 124 (as synonym).
Eleotriodes sexguttatus Koumans, Mem. Indian Mus. 13, 1941, p. 326.

D. 1 VI; D. 2 I. 12; A. I. 11-12; P. 19-20; L.l. 85-90; L.tr. 22-23.

Body elongate, compressed, height 5-5$^1/_4$ in length, 6$^3/_4$-7$^1/_3$ in total length. Head obtuse, compressed, 3$^1/_2$ in length, 4-4$^3/_5$ in total length. Eye 4$^1/_3$-4$^2/_3$ in head, interorbital $^2/_5$-$^2/_3$ eyediameter. Snout obtuse, about as long as eye, tip before or below inferior margin of eye. Jaws equal. Maxillary extends to below middle of eye. Teeth in upper jaw in one row, in front on each side 3-6 caninoid teeth. In lower jaw in front in 2 rows, laterally in one row; in front in outer row on each side 5-6 enlarged teeth, laterally of them a curved canine; inner row with about 5 enlarged teeth, laterally of them sometimes a curved canine. Supraopercular groove distinct. Open pores as in *E. strigatus*. Head and median part of nape naked, scales laterally on nape very small. Scales of body ctenoid, becoming larger towards caudal. Dorsal fins subcontinuous. First dorsal fin pointed, lower or higher than body, second, third and fourth rays are the longest, sometimes prolonged beyond the membrane. Second dorsal and anal fin anteriorly lower than body, posteriorly pointed and a little higher than body. Pectoral fin obtuse, about as long as head without snout. Ventral fin a little shorter. Caudal fin obtuse, convex, a little shorter or longer than head. Colour reddish green above, reddish pearl like below. Cheek, jaws, opercle and base of pectoral fin with 6-9 blue spots, bordered with violet, placed in 2-3 longitudinal rows. Sometimes on back before first dorsal fin an oblong deep violet blotch. Laterally on lower part of body a red longitudinal streak. Fins yellow orange to red. First dorsal fin with many violet spots, tip with a small violet black spot. Second dorsal fin with 4-6 longitudinal violet to red streaks. Anal fin with a longitudinal violet streak near margin. Base and posterior margin of anal fin with 8-10 orange ocelli, bordered with violet; these ocelli are sometimes coalized to a streak. Caudal fin above and below with red to orange ocelli, bordered with violet, in young specimens above in middle of the fin an oblong violet spot. Inner side of mouth blackish. Length 136 mm.

Habitat: Pulu Weh!; Sumatra (Padang, Priaman, Siboga, Benkulen); Nias!; Java (Surabaja!); Bawean, Rotti!; Timor!

(Kupang); Sangir; Obi major; Buru (Kajeli); Ambon!; Goram; Banda!; Aru Islands; New Guinea (river Tanah Merah!). — Red Sea (Djeddah!); Ceylon!, Philippines, Samoa (Apia!, Pago Pago), Solomon Islands, New Hebrides.

Two types of *Eleotris sexguttata* seen in Paris Museum, type of *Valenciennea violifera* seen in U.S. Nat. Museum.

12. **Amblyeleotris** Bleeker

(Bleeker, Versl. Ak. Amsterdam (2) 8, 1874, p. 373)

Body elongate, compressed, covered with about 80 scales, cycloid anteriorly, ctenoid posteriorly. Head obtuse, naked. Jaws subequal. Teeth in upper jaw in 3-4 rows, outer row enlarged; on each side in both jaws a canine. Isthmus broad. Dorsal fins close together. First dorsal fin with 6 rays. D. 2 and A. I. 12. Caudal fin obtuse.

Distribution: Java, ?Borneo, Nusa Laut, ?Red Sea (after Borsieri).

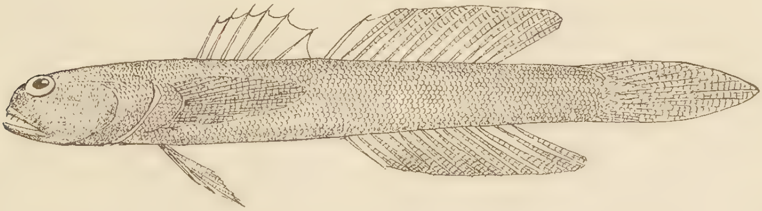

Fig. 83. *Amblyeleotris periophthalmus* (Blkr.) × 1½.

1. **Amblyeleotris periophthalmus** (Blkr.) (Fig. 83, p. 341)

Eleotris periophthalmus Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 477.
Eleotriodes periophthalmus Bleeker, o.c. 14, 1857, p. 465.
Eleotris periophthalmus Günther, Cat. Fishes 3, 1861, p. 124.
Amblyeleotris periophthalmus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 101.
?*Eleotris periophthalmus* Karoli, Termeszetraji füzetek 5, 1882, p. 167.
?*Eleotris periophthalmus* Borsieri, Ann. Mus. Civ. Genova 41 (3a Ser. 1), 1904, p. 207.
Amblyeleotris periophthalmus M. Weber, Siboga Exp. Fische 1913, p. 450.

D. 1 VI; D. 2 I. 12; A. I. 12; P. 19; L.l. 70-80; L.tr. 22.

Body elongate, compressed, height $5^1/_2$-$6^1/_2$ in length, 8 in total length. Head obtuse, a little compressed, 4 in length, 5 in total length. Eye 4 in head, interorbital $1/4$ eyediameter. Snout very obtuse, less than $1/2$ eyediameter, tip before inferior margin of pupil. Lower jaw a little prominent. Maxillary extends to below posterior margin of eye. Teeth pointed, curved, in 3-4 rows, outer row enlarged. On each side in upper and lower jaw a canine. Head and median part of nape naked. Scales laterally on nape and anteriorly on body very small, cycloid. Scales of middle and end of body and tail ctenoid. Ten scales in a transverse row in middle of caudal peduncle. First dorsal fin lower than body, middle rays are the longest. Second dorsal and anal fin lower than body, posteriorly pointed. Pectoral fin rounded. Ventral and caudal fin obtuse, about as long as head. Colour of head pink, body on back and sides yellow, breast pink, belly pearl coloured. Head and nape with orange red spots, bordered with red violet. Body with 6 pink transverse bands, the first on opercle, second from dorsal to ventral fin, third, fourth and fifth from dorsal to anal fin, sixth on caudal peduncle. Dorsal fins greenish pearl like, bordered by orange; rays with dark spots, membrane with pearl like spots. Base of pectoral fin yellow, rest weakly pink. Membrane of ventral fins bluish, rays orange. Basal half of anal fin yellowish orange with indistinct blue spots, outer half orange red with 3 longitudinal blue streaks. Caudal fin yellowish orange, violet below. Length 75 mm.

Habitat: Java (Djakarta!); ?Borneo; Nusa Laut (Nalahia!). — ?Red Sea (Eritrea). — In sea and on reefs.

Type seen in the Leiden Museum.

13. **Ophiocara** Gill.

(Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 270)

Meuschenula Whitley, Australian Zoologist 6 prt. 4, 1931, p. 325.
Ophieleotris Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 132.

Body elongate, anteriorly cylindrical, covered with 28-40 ctenoid scales. Head pointed, depressed, totally scaled. Mouth oblique, lower jaw prominent. Teeth in several rows, outer row a little enlarged. In lower jaw inner row a little enlarged. No canines. Gillopenings continued forward below, isthmus narrow. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 8-9; A. I. 6-9.

Distribution; Madagascar to Australia.

Key to the Indo-Australian species of Ophiocara

A. L.l. 38-40; L.tr. 11-13; Predorsal scales 24-26; A. I. 6-7. Maxillary extends to below middle of eye or posterior part of eye. . . . . 1. *O. porocephala* p. 343.

B. L.l. 30; L.tr. 10-11 Predorsal scales 13-18; A. I. 8-9. Maxillary extends to below anterior part of eye . . . . 2. *O. aporos* p. 346.

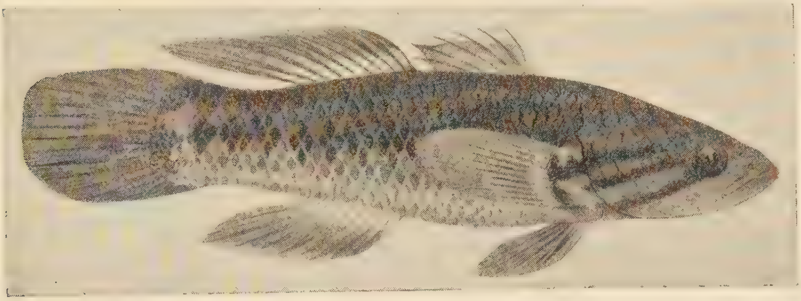

Fig. 84. *Ophiocara aporos* (Blkr.). × $^{10}/_{21}$.

1. **Ophiocara porocephala** (C.V.)

Eleotris porocephala Cuvier & Valenciennes, Hist Nat. Poissons 12, 1837, p. 237.
Eleotris ophiocephalus Cuvier & Valenciennes, o.c. p. 239.
Eleotris margaritacea Cuvier & Valenciennes, o.c. p. 240.
Eleotris viridis Bleeker, Verh. Bat. Gen. 22, 1849, p. 22.
Eleotris ophicephalus Bleeker, o.c. p. 22.
Eleotris porocephala Cantor, Cat. Mal. Fishes, Journ. Asiat. Soc. Bengal 18, 1850, p. 1177.
Eleotris ophiocephalus Cantor, o.c. p. 1178.
Eleotris porocephala Bleeker, Nat. Tijdschr. Ned. Indië 5, 1853, p. 345.
Eleotris porocephaloides Bleeker, o.c. p. 511.
Eleotris kuak Thiollière, Faune Woodlark, Ann. Sc. Phys. et Nat. Soc. Imp. d'Agric. Lyon (2) 7, 1856, p. 465.
Eleotris scintillans Blyth, Journ. Asiat. Soc. Bengal 29, 1860, p. 146.
Eleotris ophiocephalus Günther, Cat. Fishes 3, 1861, p. 107.
Eleotris cantoris Günther, o.c. p. 108.
Eleotris porocephaloides Günther, o.c. p. 109.
Eleotris ophiocephalus Playfair, Fishes Zanzibar 1866, p. 73.
?*Eleotris ophiocephalus* Day, Proc. Zool. Soc. London 1870, p. 694 (pro parte).
Eleotris ophiocephalus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 185, pl. 112 fig. A.
Ophiocara ophiocephalus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 28.
Ophiocara porocephalus Bleeker, o.c. p. 30.
Agonostoma darwiniense Macleay, Proc. Linn. Soc. N.S. Wales 2, 1878,

p. 360, pl. 9 fig. 8.

Eleotris porocephalus Day, Fishes India 1878, p. 312, pl. 67 fig. 1. — Fauna Brit. India Fishes 2, 1889, p. 289, fig. 98.

Eleotris scintillans Day, Fishes India 1878, p. 314, pl. 65 fig. 8. — Fauna Brit. India Fishes 2, 1889, p. 295.

Eleotris litoralis Day, Fishes India 1878, p. 314. — Fauna Brit. India Fishes 2, 1889, p. 295.

Eleotris ophiocephalus Sauvage, Poissons de Madagascar 1891, p. 379, pl. 41A figs. 3, 3a.

Eleotris porocephala Perugia, Ann. Mus. Civ. Genova 33, (2a Ser. 13) 1893, p. 253.

Eleotris ophiocephalus Steindachner, Abh. Senckenb. Naturf. Ges. 25, 1901, p. 432.

Ophiocara porocephala Fowler, Proc. Ac. Nat. Sci. Philadelphia 57, 1905, p. 510.

Ophiocara porocephala Jordan & Richardson, Bull. Bur. Fisheries 27, (1907) 1908, p. 274.

Eleotris porocephalus M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 32. —Nova Guinea 9 Zool. 4, 1913, p. 573.

Eleotris (Ophiocara) porocephalus M. Weber, Siboga Exp. Fische 1913, p. 447.

Eleotris ophiocephalus Pietschmann, Jahrb. Nass. Ver. f. Naturkunde Wiesbaden 66, 1913, p. 198 (pro parte?).

Ophiocara darwiniensis McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 277.

Ophiocara porocephala Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 69, pl. 5 fig. 3.

Ophiocara ophicephalus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 390.

?*Ophiocara macrolepidotus* Fowler, o.c. p. 390 (pro parte?).

Ophiocara hoedtii Fowler, o.c. p. 391 (pro parte).

Meuschenula darwiniensis Whitley, Australian Zoologist 6 prt. 4, 1931, p. 325.

Ophiocara porocephala Herre, Field Mus. Nat. Hist. Zool. 21, 1936, pp. 346, 457.

Ophiocara porocephala Koumans, Zool. Meded. Leiden 20, 1937, p. 16. — Mem. Indian. Mus. 13, 1941, p. 322.

Ophiocara porocephala Aurich, Int. Revue Hydrobiol. u. Hydrograph 38, 1938, p. 137, fig. 6.

Ophiocara darwiniense Koumans, Zool. Meded. Leiden 22, 1940, p. 166 (as synonym).

Ophiocara porocephala Harry, Proc. Calif. Zool. Club I, No. 3, 1048, fig. 1 and 2.

D. 1 VI; D. 2 I. 8-9; A. I. 6-7; P. 15; L.l. 38-40; L.tr. 11-13; Predorsal scales 24-26.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_3$ in length, 5-6 in total length. Head depressed, $2^3/_4$-3 in length, $3^1/_2$-4 in total length. Profile straight to convex. Eye 4-7 in head, interorbital 1-$2^1/_2$ eyediameter. Snout pointed, as long as, or a little shorter than eye, tip before middle of eye. Anterior nostrils near margin of snout, in short tubes. Lower jaw prominent. Maxillary extends to below middle or posterior part of eye. Teeth in many rows, outer row only a little enlarged, subequal. In lower jaw some teeth of inner row may be enlarged. Some mucous canals radiate under eye. Two indistinct longitudinal mucous canals on cheek. Some open pores: one on snout on each side before posterior nostril, in interorbital one open pore medially and 2 open pores on each side near eye; one behind each eye; 2-4 along posterior margin of preopercle. Supraopercular groove distinct. Scales of body ctenoid. Head totally scaled. Scales of head, nape, breast and belly cycloid to ctenoid. First dorsal fin half as high as body, second, third and fourth rays are the longest. Second dorsal fin higher than the first. Anal fin shorter than second dorsal fin. Pectoral fin rounded, about as long as head without snout. Ventral fin about as long as pectoral fin. Caudal fin rounded, a little shorter than head, in large specimens more lanceolate and about as long as head. Colour dark green to dark olivous above, lighter below. Body with dark longitudinal stripes. In large specimens each scale of body has a dark base, the longitudinal lines become indistinct. Finmembranes dusky to violet, rays orange. Second dorsal, anal and caudal fin bordered with reddish orange. Finrays of second dorsal and caudal fin spotted. Head, body, second dorsal and anal fin with yellowish orange spots, in young specimens irregularly placed, in adult in rows. Young specimens with 2-5 transversal silvery bands, the first before insertion of first dorsal fin, the second between first and second dorsal fin, the third below second dorsal fin, the fourth behind second dorsal fin, the fifth on base of caudal fin. Some of these bands may be absent. Length 320 mm.

Nom. indig.: Ikan gabus lawut (Mal. Djakarta), Ikan balang (Jav.), Ikan puntang (Madura), lebås lebås (Tapola, Simalur), Bakut (Balikpapan), Blonguran (Bandjermasin).

Habitat: Singapore; Pulu Weh!; Biliton (Tjirutjup); Karimata!; Sumatra (Telokbetong, Trussan, Padang, Priaman, Batang Serangan); Simalur (Sinabang bay!, Sibigo!, Lugu!, Lasikin!); Nias (West Nias!, Lahewa!, Gunung Sitoli!, Lolowau); Engano (Kifa juc); Verlaten Island North!; Java (Djakarta!, Tandjong Priok!, Tjilatjap, Surabaja, Anjer, Dirk de Vriesbay!); Madura (Kammal); Bali (Sangsit); Lamakera Strait!; Wetter (river near Ilmedo!); Borneo (Balikpapan!, Sungei Manggar near Balikpapan!, Bontang!, Baram!, Kubu Terentang!, Sarawak); Sulu Islands (Buan Island, Bungau, Jolo); Celebes (Makassar!, Kema, Menado, Gorontalo, Paré Paré!, Pompanua, Boloang); Salibabu (Lirung!); Muna (Kali La!, Raha!); Halmahera (river Oba, river Kau); Ternate (Sula Takomi di bawah!); Batjan (Labuha); Obi!; Obi major (Laiwui!); Buru (Kajeli!, Leksula!, Wa' Tina!, Wai Suna!); Ceram (Wahai); Nusa Laut!; Ambon!; Haruku (Wae memi!); Banda!; Kei Islands (Great Kei!, Elat!); Aru Islands!; New Guinea (brook near Humboldt bay!, Kajo bay, Sepik river, Delta Division!, Prauwen bivak!, Andai!, ?Bogodjim). — India!, Andamans!, Malaya!, Siam, China, Philippines!, Australia! to the South Pacific. — In sea and rivers.

Colour variety *darwiniense* (Macleay): Central part of many scales with a light spot. Membrane of vertical fins dark, second dorsal and caudal fin with rows of yellowish ocelli, some similar ocelli on first dorsal fin, but absent on anal fin. Margin of second dorsal fin, upper and lower margin of caudal fin light. Anal fin broadly bordered with yellow. Ventral fin dusky with lighter margin.

Habitat: Obi major (Laiwui!); British New Guinea (Delta Division!); Australia!. Perhaps *Eleotris margaritacea* C.V. belongs to this variety.

Types of *Eleotris ophiocephalus* seen in Paris Museum, types of *E. cantoris* Gthr. (*E. porocephalus* Cant.) seen in British Museum (N.H.), cotype of *Agonostoma darwiniense* seen in Australian Museum, Sydney.

Note: A specimen from Buru (Wa' Tina) has A. I. 8.

2. **Ophiocara aporos** (Blkr.) (Fig. 84, p. 343)

Eleotris aporos Bleeker, Nat. Tijdschr. Ned. Indië 6, 1854, p. 59.
Eleotris Hoedtii Bleeker, o.c. p. 496.
Eleotris Tolsoni Bleeker, o.c. p. 542.
Eleotris aporos Günther, Cat. Fishes 3, 1861, p. 109.
Eleotris hoedtii Günther, o.c. p. 110.
Eleotris aporus Bleeker, Ned. Tijdschr. Dierk. 2, 1865, p. 293.
Eleotris ophiocephalus Day, Proc. Zool. Soc. London 1870, p. 694 (pro parte).
Ophiocara aporus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 105.
Eleotris macrolepidotus Günther, Fische der Südsee 6, Journ. Mus. Godeffroy, 13, 1877, p. 186 (not of Bloch).
Eleotris macrocephalus Günther, o.c. pl. 112 figs. B, B', B'' (not of Blkr.).
Ophiocara aporus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 33.
Ophiocara Hoedti Bleeker, o.c. p. 35.

Eleotris ophiocephalus Day, Fishes India 1878, p. 312, pl. 62 fig. 2 (sine syn., not of C. V.).
Eleotris planiceps Macleay, Proc. Linn. Soc. N.S. Wales 8, 1883, p. 206 (not of Castelnau, 1878 or Macleay, 1882).
Eleotris aporocephalus Macleay, o.c. 9, 1884, p. 33 (substitute name).
Eleotris tumifrons Day, Fishes India Suppl. 1888, p. 795 (not of C.V.). — Fauna Brit. India Fishes 2, 1889, p. 292 (not of C.V.).
Eleotris macrolepidota Steindachner, Abh. Senckenb. Naturf. Ges. 25, 1901, p. 431 (not of Bloch).
Eleotris aporus M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 252.
Eleotris Hoedti M. Weber, o.c. p. 253.
Ophiocara aporos Jordan & Richardson, Bull. Bur. Fisheries 27, (1907) 1908, p. 274.
Eleotris Hoedti M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 32.
Eleotris (Ophiocara) Hoedti M. Weber, Siboga Exp. Fische 1913, p. 446.
Eleotris (Ophiocara) aporos De Beaufort, Bijdragen Dierkunde 1913, p. 135.
Eleotris (Ophiocara) hoedti De Beaufort, o.c. p. 135, pl. 2 figs. 6, 7.
Eleotris ophiocephalus Pietschmann, Jahrb. Nass. Ver. f. Naturkunde Wiesbaden 66, 1913, p. 198 (pro parte?).
Ophiocara aporos McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 275.
?*Hypseleotris agilis* Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 38, pl. 2 fig. 3 (young?).
Ophiocara aporos Herre, o.c. p. 65, pl. 5 fig. 2, pl. 28 fig. 3.
?*Ophiocara macrolepidotus* Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 390 (pro parte?).
Ophiocara aporos Fowler, o.c. p. 391.
Ophiocara hoedtii Fowler, o.c. p. 391 (pro parte).
Eleotris ophiocephalus Pellegrin, Mem. de Malgache 14, 1933, p. 127 (not of C.V.).
Ophiocara aporos Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 456.
Ophiocara aporos Tomiyama, Jap. Journ. Zool. 7 no. 1, 1936, p. 45.
Ophiocara aporos Koumans, Zool. Meded. Leiden 20, 1937, p. 18. — Mem. Indian Mus. 13, 1941, p. 323.
Ophieleotris aporos Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 132, fig. 5.
Ophieleotris agilis Aurich, o.c. p. 136.
Ophiocara aporos subspec. ***rigonis*** Whitley, Rec. Austral. Mus. 20, 1938, p. 230.
Mogurnda fulvescens (McCulloch & Ogilby Mus. name) Koumans, Zool. Meded. Leiden 22, 1940, p. 176 (as synonym).
Hypseleotris agilis Koumans, o.c. p. 155 (as synonym).

D. 1 (V) VI; D. 2 I. 8-9; A. I. 9; P. 14-15; L.l. 30; L.tr. 10-11; Predorsal scales 13-18.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 4-$4^3/_4$ in length, $5^1/_3$-6 in total length. Head depressed, $3^1/_4$-$3^1/_2$ in length, 4-$4^2/_5$ in total length. Profile concave. Eye 4-$5^1/_2$ in head, interorbital 1-$2^1/_4$ eyediameter. Snout pointed, from a little shorter than eye to longer than eye, tip before middle of eye. Anterior nostrils near margin of snout, in short tubes. Lower jaw a little prominent. Maxillary extends to below anterior part of eye. Teeth in many rows, small, outer row a little enlarged, subequal. Two longitudinal mucous canals on cheek. Only 2-3 open pores along posterior margin of preopercle, no other open pores on head. Supraopercular groove indistinct. Scales of body ctenoid posteriorly, cycloid anteriorly. Head totally scaled. First dorsal fin obtuse, half as high as body, second, third and fourth rays are the longest. Second dorsal fin a little higher than the first. Anal fin equal to second dorsal fin, but lower. Pectoral fin obtuse, about as long as head without snout. Ventral fin a little shorter. Caudal fin obtuse, a little longer than head without snout. Colour dark above, orange below. Scales of back and sides with dark spots. Two or three dark stripes, in life reddish, from eye to opercle. Fin-membranes dark, rays orange. Dorsal fins, ventral and anal fin bordered with red. Base of pectoral fin with dark transverse stripe, bordered with red. Caudal fin spotted with yellow. Length 290 mm.

Nom. indig.: Lebot (Halmahera), Ikan gabus (Batjan), Sengilu (Sumba).

Habitat: Sumatra (Tandjong); Simalur (Sinabang!, Lugu!); Pulu Babi!; Nias (Tolok dalam!, Lahewa!, Gunung Sitoli!, Lolowau); Pulu Nako near Nias; Engano (Meok!, Buah Buah!); Java (Djungkulon); Sumbawa (Taliwong!, Brang Nee river!); Flores (Konga river!, Alo Wai river!, Donda river!); Adonare; Sumba (Liku, Laora!, river between Mangeli and Wasang!); Timor (Mota Berluli!, Atapupu, Delhi); Dammar!; Wetter (near Ilmedo!); Borneo (Sarawak); Sulu Islands (Tawi Tawi); Celebes (Penango!, Gorontalo!, Klabatdiatas, Tondano lake); Beo!; Karakelang (Gunung Duata!); Salibabu (Lirung!); Buton (Bau bau river!); Halmahera (Galela lake!); Morotai!; Ternate!; Batjan (Labuha!); Obi major (Laiwui!); Sula Islands!; Buru (Kajeli!, Leksula!, Waai Suna); Ceram (Kelang river!); Saparua!; Nusa Laut!; Ambon! (Ajer Larike!); Haruku (Wae Memi!); Banda!; Kei Islands (Elat, Warka); Waigeu (Mumes brook!, river Waiha!, river Waisa!); New Guinea (Sentani lake!, river Mosso!, Tawarin river!, Mbai river!, Lorentz river!, Klipong river!, Hollandia!, Bronbeek!, Mamapiri!, Mamberano!, Pionier bivak!, Prauwenbivak!, Idenburg river!, Doorman river!, Rigo, Sorong door, Sepik river, Bogadjim?, Etna bay!, Delta Division!). — Madagascar!, India!, Andamans!, Nicobars!, Siam!, Philippines!, Admiralty Islands!, New Ireland!, New Britain, Solomon Islands, New Hebrides, Pelew!, Oualan, Fiji, Australia. — In sea and rivers.

Variety *aporos* (Blkr.): Laterally 8-10 dark transversal bars on back, ending in middle of sides in 8-10 dark spots in a longitudinal row. Ventral fins dark. Predorsal scales 17-18.

Variety *hoedtii* (Blkr.): Laterally a dark band from head to caudal. Ventral fins light. Predorsal scales 13-15.

Variety *güntheri* Koumans: Body dark coloured, the centre of many scales show a light spot; these spots form longitudinal rows on the body. On head several light spots. On preopercle and opercle the light spots are placed in rows, which run obliquely backwards and downwards from the eye, about along the dark stripes in the other varieties. Membrane of vertical fins dark. Dorsal fins, caudal and anal fin with rows of light round to oblong spots. Anal and ventral fin bordered with light, ventral fin otherwise dark. First dorsal fin with a light submarginal band. This variety has about the same pattern of colour as the variety *darwiniense* of *Ophiocara porocephala* (C. V.). It is named as subspecies *rigonis* n. subsp. by Whitley, Rec. Austr. Mus. 20, 1938, p. 230.

Habitat: Morotai; New Guinea (Rigo!); Admiralty Islands (Manus!); Oualan!; Pelew Islands!.

Specimens of Bleeker's collection of *Eleotris aporos* and *hoedtii* seen in the Leiden Museum.

Note: Two specimens from Prauwenbivak, Idenburg river, New Guinea, of 60 and 72 mm differ in so far as they have D. 2 I. 7; A. I. 7.

14. **Bunaka** Herre

(Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 60)

Lizettea Herre, Philippine Journ. Sci. 59 no. 2, 1936, p. 275.

Body elongate, anteriorly cylindrical, posteriorly compressed, covered with about 60 ctenoid scales. Head depressed, scaled above behind the eyes, on cheek and opercle. Mouth oblique, lower jaw prominent. Teeth in several rows, outer and inner row not or hardly enlarged, no canines. Isthmus moderate. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 and A. I. 8-9.

Distribution: India to Admiralty Islands, Pelew Islands and Australia.

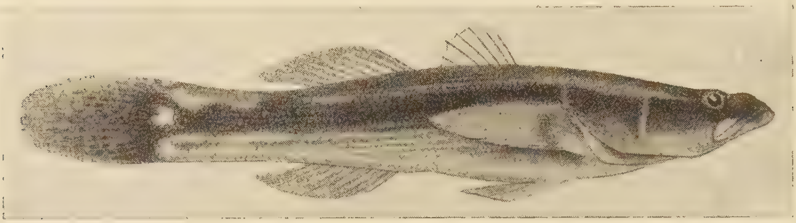

Fig. 85. *Bunaka herwerdenii* (M. Weber). × 2/3.

Key to the Indo-Australian species of Bunaka

A. Scales of body with a dark spot, often forming longitudinal stripes on body. No broad longitudinal band on body	1. *B. gyrinoides* p. 350.
B. Indistinct dark lines along the rows of scales. From snout to caudal fin a broad dark longitudinal band	2. *B. herwerdenii* p. 351.

1. **Bunaka gyrinoides** (Blkr.)

Eleotris gyrinoides Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 272.
Eleotris gyrinoides Günther, Cat. Fishes 3, 1861, p. 123. — Fische der Südsee 6, Journ. Mus. Godeffroy 13, 1877, p. 188.
Eleotris gyrinoides Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 20.
Eleotris canarensis Day, Fishes India 1878, p. 313, pl. 69 fig. 2. — Fauna Brit. India Fishes 2, 1889, p. 294.
Guavina gyrinoides Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 384.
Eleotris gyrinoides M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 254.
Eleotris gyrinoides De Beaufort, Bijdragen Dierkunde 1913, p. 135.
?Eleotris Herwerdenii Hase, Jen. Zeitschr. f. Naturw. 51, 1914, p. 537 (not of M. Weber).
Bunaka pinguis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 61, pl. 27 fig. 2.
Guavina gyrinoides Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 389.
Lizettea pelewensis Herre, Philipp. Journ. Sci. 59 no. 2, 1936, p. 276, pl. 1 fig. 1 (abnormal specimen).
Lizettia (misprint for *Lizettea*) *pelewensis* Koumans, Zool. Meded. Leiden 22, 1940, p. 150 (as synonym).
Bunaka pinguis Koumans, o.c. pp. 154, 182 (as synonym).
Bunaka gyrinoides Koumans, Mem. Indian Mus. 13, 1941, p. 327.
Bunaka sticta Herre, Stanford Ichth. Bull. 2 No. 4, 1942, p. 119.
Bunaka gyrinoides Harry, Proc. Calif. Zool. Club I, No. 3, 1948, p. 15, fig. 3 and 4.

D. 1 VI; D. 2 I. 8; A. I. 8; P. 18-19; L.l. 60; L.tr. 16-17; Predorsal scales 40.

Body anteriorly cylindrical, posteriorly compressed, height 4-5 in length, 5-6$^1/_2$ in total length. Head pointed, depressed, 2$^3/_4$-3$^1/_2$ in length, 3$^1/_2$-4 in total length. Profile above the eyes a little concave. Eye 5-5$^1/_2$ in head, interorbital 1 eyediameter or more. Snout pointed, shorter than eye, or as long as eye, tip before upper half of eye. Anterior nostril in a very short tube. Lower jaw a little prominent. Maxillary extends to below posterior half or to below middle of eye. Teeth equal, small. Tongue rounded. Two or three longitudinal mucous canals on cheek. Supraopercular groove distinct. Scales of body ctenoid, those of head, nape and breast cycloid. Head scaled above from between the eyes, snout naked, cheek and opercle scaled. First dorsal fin obtuse, half as high as body, third ray is the longest. Second dorsal and anal fin a little higher than first dorsal fin. Base of pectoral fin scaled, pectoral fin about as long as head without snout. Ventral fin a little shorter. Caudal fin rounded, shorter than head. Colour blackish green above, orange green below. Each scale with a dark spot, often forming longitudinal stripes on body. Fins orange, rays spotted with dark spots, forming bands. Base of pectoral fin with blackish spot. Head sometimes with a broad dark longitudinal stripe from snout to eye, some narrower radiating under eye. Length 320 mm.

Habitat: Sumatra (Benkulen, Priaman!); Simalur (Lugu, Sinabang!); Mentawei Islands (Sibirut); Pulu Babi!; Java (Majang, Kali Mandiku!); Flores (Konga river!, Alo Wai!); Sumba (Laora); Timor (Noil Enfoit!); Babber (Yer Lawi!); Sulu Islands (Tawi tawi); Celebes (Sawangan, river Tjinrana near Pampanua!, Tempe lake!, river Lapa-lupa near Tempe!); Buru (Kajeli!); Ceram (Honitetu!, river Eme!); Waigeu (Waisa). — India!, Ceylon!, Philippines!, Ponapé!, Admiralty Islands!, Pelew Islands!, Australia. — In rivers and estuaries.

Types of *Eleotris gyrinoides* seen in the Leiden Museum, a specimen of *E.canarensis* from Mangalore, collection Day seen in the Indian Museum, Calcutta, type of *Bunaka pinguis* seen in Bureau of Science, Manila, type of *Lizettea pelewensis* seen in Stanford University.

2. **Bunaka herwerdenii** (M. Weber) (Fig. 85, p. 350)

Eleotris Herwerdenii M. Weber, Notes Leyden Mus. 32, 1910, p. 238. — Nova Guinea 9 Zool. 4, 1913, p. 594, pl. 13 fig. 2, pl. 14 fig. 2.
Eleotris dalyensis Rendahl, Nyt. Mag. f. Naturv. 60, 1922, p. 192.

Eleotris herwerdenii Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 393.
Oxyeleotris herwerdenii Whitley, Rec. Austral. Mus. 20, 1938, p. 232.

D. 1 VI; D. 2 I. 8-9; A. I. 7-8; P. 17; L.l. 62-70; L.tr. 18-22; Predorsal scales 35-40 (+ smaller ones).

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-5.9 in length, 6-6 1/2 in total length. Head pointed, depressed, 2.7-3 in length, 3.4-3.5 in total length. Profile before first dorsal fin a little convex, between the eyes concave. Eye 4.6-8 in head, interorbital 1-2 eyediameters. Snout equal to eye or about 1 1/2 eyediameter, tip before middle of eye. Anterior nostril in a short tube. Lower jaw prominent. Maxillary extends to beyond middle of eye. Tongue rounded. Teeth in bands, equal. On inner side of each nostril an open pore, in interorbital on each side near eye a pore, one behind each eye, one behind each eye at the beginning of supraopercular groove, some in supraopercular groove and along posterior margin of preopercle. Two longitudinal canals on cheek. Scales of head, nape and belly cycloid, on body ctenoid. Head scaled above between and behind the eyes, on cheek and opercle. Snout naked. First dorsal fin a little higher than half the height of body, third ray is the longest. Second dorsal and anal fin a little higher. Pectoral fin about as long as postorbital part of head. Ventral fin a little shorter. Caudal fin rounded, as long as postorbital part of head. Colour on back dark brown, belly yellowish with indistinct darker lines along the rows of scales. From snout through eye, running dorsal of base of pectoral fin, a broad dark longitudinal band to caudal fin, where it contains a light blotch. Caudal fin blackish with indistinct blotches and stripes. Other fins with darker rays, those of dorsal fins indistinctly spotted. Length 352 mm.

Habitat: New Guinea (Varen river a branch of Lorentz river, Lorentz river!, Pandanus ditch, Upper Fly river!, ?Sermowai river!). — North Australia (Katherine river!, Daly river).

Types of *Eleotris herwerdenii* seen in the Amsterdam Museum.

15. **Oxyeleotris** Bleeker

(Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 302)

Gigantogobius Fowler, Proc. Ac. Nat. Sci. Philadelphia 57, 1905, p. 511.
Boroda Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 58.
Callieleotris Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 155.
Borodamirus Whitley, Rec. Austral. Mus. 19, 1935, p. 250.

Body elongate, anteriorly cylindrical, posteriorly compressed. Head pointed, depressed, scaled above and on the sides. Only in *O. urophthalmoides* the first branchiostegal ray ends anteriorly in a spine, in the other species this spine is absent. Scales of body ctenoid, 45-100 in a longitudinal series. Teeth in several rows, in upper jaw outer row enlarged, in lower jaw in front outer row enlarged, laterally inner row enlarged. No true canines. Lower jaw prominent, mouth oblique. Gillopenings a little continued forward below, isthmus moderate. First dorsal fin with 6 rays. D. 2 I. 9-12; A. I. 7-10.

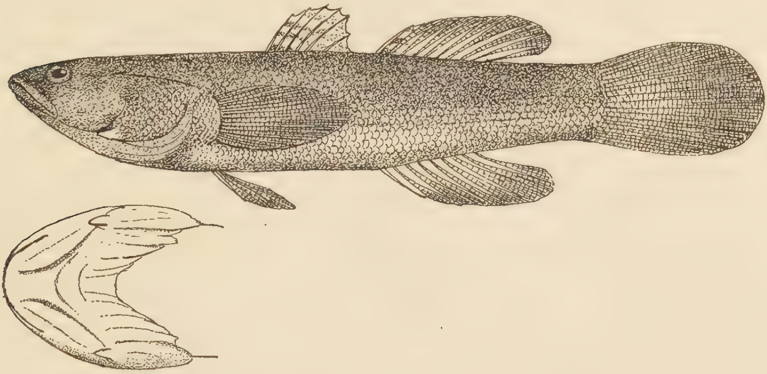

Fig. 86. *Oxyeleotris urophthalmoides* (Blkr.). n.s.

Distribution: Malacca to Philippines, Australia and the Pacific.

Key to the Indo-Australian species of Oxyeleotris

A. D. 2 I. 9; A. I. 7-9.
  a. 80-102 scales in L.l.
    a′. Body with irregular blotches. Upper part of caudal peduncle without ocellus . . . . 1. *O. marmorata* p. 354.
    b′. Body without blotches. Upper part of caudal peduncle with ocellus. . 2. *O. urophthalmus* p. 355.
  b. 60-70 scales in L.l.
    a′. First branchiostegal ray ends anteriorly in a spine. L.l. 60-70; L.tr. 15-16; 45-50 predorsal scales. 3. *O. urophthalmoides* p. 357.
    b′. First branchiostegal ray ends anteriorly not in a spine. L.l. 62-

65; L.tr. 19-20; 40-48 predorsal
scales . . . . 4. *O. lineolatus* p. 358.
B. D. 2 I. 10-12; A. I. 7-11.
  a. L.l. 45-77; L.tr. 14-24; 26-36 predorsal scales. . . . . 5. *O. fimbriatus* p. 359.
  b L.l. 80-102; L.tr. 25-28; 50-60 predorsal scales . . . . 2a. *O. urophthalmus* var. *novae guineae* p. 356.

1. **Oxyeleotris marmorata** (Blkr.)

Eleotris marmorata Bleeker, Nat. Tijdschr. Ned. Indië 3, 1852, p. 424.
Eleotris marmorata Günther, Cat. Fishes 3, 1861, p. 123.
Oxyeleotris marmorata Bleeker, Arch. neerl. sc. ex. et nat. 9, 1874, p. 303. — Versl. Ak. Amsterdam (2) 11, 1877, p. 22.
Eleotris marmorata Vaillant, Notes Leyden Mus. 24, 1902, p. 160.
?*Gigantogobius jordani* Fowler, Proc. Ac. Nat. Sci. Philadelphia 57, 1905, p. 511, fig. 13.
Eleotris (Oxyeleotris) marmorata M. Weber, Siboga Exp. Fische 1913, p. 448.
Oxyeleotris marmorata Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 74.
Oxyeleotris marmorata Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 389. — Proc. Ac. Nat. Sci. Philadelphia 87, 1935, p. 160.
Callieleotris platycephalus Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 156, figs. 123, 124.
Oxyeleotris marmorata Koumans, Zool. Meded. Leiden 19, 1936, p. 129.
Gigantogobius jordani Koumans, o.c. 22, 1940, p. 134 (as probable synonym).
Callieleotris platycephalus Koumans, o.c. p. 135 (as synonym).

D. 1 VI; D. 2 I. 9; A. I. 7-8; P. 17-19; L.l. 80-90. L.tr. ± 25; Predorsal scales 60-65 (+ 9-11).

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_2$-5 in length, $5^1/_2$-6 in total length. Head pointed, depressed, $2^3/_4$-3 in length, $3^1/_3$-4 in total length. Profile concave. Eye 7-9 in head, interorbital $1^1/_2$-$2^1/_2$ eyediameter. Snout pointed, tip before upper part of eye. Lower jaw prominent. Maxillary extends to below posterior margin of eye or not so far. Teeth in many rows; in upper jaw outer row enlarged, behind symphysis 2-4 caninoid teeth in middle rows; in lower jaw outer row enlarged, unequal, some teeth caninoid, lateral teeth of inner row enlarged. Mucous canals: 2-3 from eye running obliquely downwards and backwards, 2 longitudinal ones on cheek, crossed by 2 vertical ones. Supraopercular groove distinct. Scales of body ctenoid, on head, nape and breast cycloid. Head scaled on snout, between and above behind the eyes, on cheek and opercle. First dorsal fin obtuse, half as high as body, second and third rays are the longest. Second dorsal fin a little higher than the first. Anal fin shorter than second dorsal fin. Pectoral fin obtuse, about as long as postocular part of head. Ventral fin much shorter. Caudal fin obtusely rounded, shorter than head. Colour darkish green above, lighter below. Head below with pale reddish to yellowish spots. Body anteriorly clouded, posteriorly with 3 irregular reddish transverse bands. First dorsal fin anteriorly dark. Other fins reddish with darker parts, rays spotted. Length 460 mm.

Nom. indig.: Betutu, Batutuk (Borneo).

Habitat: Singapore!; Sumatra (Palembang!, Moara Kompeh, Gunung Sahilan!, Djambi!, Danau kota, Sungei Si Russu); Enggano (Bua Bua); Borneo (Bandjermasin, Sintang!, Montrado, Batu Pangal!, Smitau!, lake Baram!, Pontianak, Kapuas river, Sarawak); Celebes; Ternate. — Siam!, Malacca, Philippines, Fiji Islands!. — In rivers and estuaries.

Types of *Eleotris marmorata* seen in the Leiden Museum, type and paratype of *Callieleotris platycephalus* seen in Acad. of Nat. sci., Philadelphia.

2. **Oxyeleotris urophthalmus** (Blkr.)

Eleotris urophthalmus Bleeker, Nat. Tijdschr. Ned. Indië 2, 1851, p. 202.
Eleotris urophthalmus Günther, Cat. Fishes 3, 1861, p. 128.
Eleotris siamensis Günther, o.c. p. 129.
Eleotris urophthalmus Bleeker, Arch. neerl. sc. ex. et nat. 10, 1875, p. 104.
Oxyeleotris urophthalmus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 23.
Eleotris urophthalmus M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 596 (pro parte).
Eleotris urophthalmus Vinciguerra, Ann. Mus. Civ. Genova 50 (3a Ser. 10), 1926, p. 550.
Oxyeleotris urophthalmus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 389.
Oxyeleotris urophthalmus Koumans, Zool. Meded. Leiden 19, 1936, p. 129.

D. 1 VI; D. 2 I. 9-12; A. I. 8-10; P. 15-18; L.l. 85-102; L.tr. 24-29; Predorsal scales 55-60 (+ 8-12).

Body elongate, anteriorly cylindrical, posteriorly compressed, height about $5^1/_2$ in length, 7-8 in total length. Head pointed, depressed, about $3^1/_2$ in length, $4\text{-}4^1/_4$ in total length. Profile concave. Eye 6-7 in head, interorbital $1^3/_4\text{-}2^3/_4$ eyediameter. Snout pointed, tip before middle of eye. Nostrils in short tubes near margin of snout. Teeth small in many rows. In upper jaw outer row a little enlarged. In lower jaw outer row enlarged, unequal, one of the middle rows of teeth laterally enlarged. Two longitudinal mucous canals on cheek, crossed by transversal ones, radiating from the eyes. Supraopercular groove distinct. Some open pores round the eyes and along posterior margin of preopercle. Scales posteriorly ctenoid, anteriorly cycloid. Head scaled above on snout, between and behind the eyes, on cheek and opercle. First dorsal fin obtuse, less than half the height of body, third and fourth rays are the longest. Second dorsal fin higher than the first. Anal fin shorter than second dorsal fin. Pectoral fin obtuse, shorter than head without snout. Ventral fin a little shorter. Caudal fin obtusely rounded, shorter than head. Colour dark green above, orange green below. Fins violet to dark, rays orange. Rays of dorsal fins and caudal fin spotted. Base of caudal fin above with dark ocellus, bordered by red. Length 280 mm.

Nom. indig.: Belunguran itam (Samarinda).

Habitat: Singapore!; Simalur (Sinabang bay!); Borneo (Pontianak, Tumbang Bunut!, Kahajan, Bandjermasin, Padang Tikar bay!, Samarinda, Sarawak); Celebes (Gorontalo); New Guinea (Lorentz river!, Mamberano river!, Western Division!). — Siam. — In rivers and estuaries.

Types of *Eleotris urophthalmus* seen in the Leiden Museum, types of *E. siamensis* seen in British Museum (N.H.).

Note: In the specimens of *Oxyeleotris urophthalmus* from Singapore, Simalur, Borneo, Celebes and Siam, which were studied, the number of rays in second dorsal fin was I. 9, that of anal fin was I. 8. The number of scales in L.l. varied from 85-92; in L.tr. from 24-26. Before the first dorsal fin these specimens showed 56-58 large scales, which extend to a little behind the eyes, before these large scales there are in interorbital space 9-12 scales.

In the specimens from New Guinea I found that the number of rays in second dorsal fin varied from I. 10-12; that of anal fin from I. 9-10. The number of scales in L.l. varied from 80-102; in L.tr. from 25-29. Predorsal scales from 50-60 large scales and before these 8-12 smaller ones. In other respects the specimens from New Guinea agree with the types and specimens of *O. urophthalmus,* so Koumans named them (Zool. Meded. Leiden 19, 1936, p. 130) variety *novae guineae.*

The 3 specimens stated by M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 596 as *Eleotris urophthalmus* from mouth and upper Sermowai river, belong to *O. fimbriatus* (M. Weber).

3. **Oxyeleotris urophthalmoides** (Blkr.) (Fig. 86, p. 353)

Eleotris urophthalmoides Bleeker, Nat. Tijdschr. Ned. Indië 4, 1853, p. 273.
Eleotris urophthalmoides Günther, Cat. Fishes 3, 1861, p. 128.
Oxyeleotris urophthalmoides Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 25.
Eleotris urophthalmoides Vinciguerra, Ann. Mus. Civ. Genova 50 (3a Ser. 10), 1926, p. 551.
Oxyeleotris urophthalmoides Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 389.
Oxyeleotris boddaerti Hardenberg, Treubia 15, 1936, p. 253 (error for *urophthalmoides* Blkr.).
Oxyeleotris urophthalmoides Koumans, Zool. Meded. Leiden 19, 1936, p. 131.

D. 1 VI; D. 2 I. 9; A. I. 8; P. 17-18; L.l. 60-70; L.tr. 15-16; Predorsal scales 45-50 (+ 9-12).

Body elongate, anteriorly cylindrical, posteriorly compressed, height $5^1/_2$-6 in length, $6^1/_4$-7 in total length. Head pointed, depressed, 3-$3^1/_2$ in length, $3^2/_3$-$4^1/_4$ in total length. Profile convex, over eye a little concave. Eye 6-7 in head, interorbital $1^1/_2$-2 eyediameters. Snout pointed, about as long as eye, tip before middle of eye. Anterior nostrils near margin of snout, in short tubes. Lower jaw a little prominent. Maxillary extends to below posterior half of eye. Teeth in many rows, outer row only a little enlarged, subequal; in lower jaw inner row laterally enlarged. Two or more longtudinal mucous canals on cheek, crossed by transversal ones. Supraopercular groove well developed. First branchiostegal ray ends anteriorly in a short blunt spine. Scales of body ctenoid posteriorly, cycloid anteriorly. Head scaled on snout, above behind eye and on cheek and opercle with small scales. First dorsal fin obtuse, half as high as body, second, third and fourth rays are the longest. Second dorsal fin a little higher than the first. Anal fin much shorter than second dorsal fin. Pectoral fin rounded, as long as head without snout, base scaled. Ventral fin a little shorter than pectoral fin. Caudal fin obtuse, shorter than head. Colour reddish above, orange green below. On back and sides dark longitudinal stripes, following the rows of the scales. Finmembranes light violet, finrays yellowish to red, they are, except those of ventral fins, spotted. Membrane of anal fin with pearl like spots. Base of caudal fin above with black ocellus, bordered by orange red. Length 198 mm.

Habitat: Sumatra (?Priaman, Palembang, Lematang-Enim); Nias!; Borneo (Sambas, Kahajan Bandjermasin, Sungei Kakap!, Padang Tikar bay, Sungei Terentang, Sarawak). — In rivers.

Types of *Eleotris urophthalmoides* seen in the Leiden Museum.

Note: *Oxyeleotris urophthalmoides* is distinguished from the other species of *Oxyeleotris* by the first branchiostegal ray, which ends anteriorly in a short blunt spine, about in the same way as in *Belobranchus*. From *Belobranchus* it differs, however, in several important characters, so that it has nothing to do with this genus. In all characters it is a typical *Oxyeleotris*, so that it is not necessary to regard it as the type of a new genus.

4. **Oxyeleotris lineolatus** (Steind.)

Eleotris lineolatus Steindachner, Sitz. ber. Ak. Wiss. Wien 55, no. 1, 1867, p. 13.
?*Eleotris planiceps* Macleay, Proc. Linn. Soc. N.S. Wales 7 prt. 1, 1882, p. 69 (preocc.).
Eleotris immaculatus Macleay, o.c. 8 prt. 2, 1883, p. 268.
?*Eleotris selheimi* Macleay, o.c. 9 prt. 1, 1884, p. 33 (substitute name for *E. planiceps*).
Eleotris crescens De Vis, Proc. Roy. Soc. Queensland 2, 1886, p. 33.
Guavina immaculata Jordan & Seale, Bull. Bur. Fisheries 25, (1905) 1906, p. 384.
Eleotris (Oxyeleotris) heterodon M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 255, pl. 13 fig. 7.
Eleotris heterodon M. Weber, o.c. 9, Zool. 4, 1913, p. 596 (pro parte).
Oxyeleotris lineolatus McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 265 (see synonyms).
Oxyeleotris lineolatus Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 390.
Boroda malua Herre, Field Mus. Nat. Hist. Zool. 18 no. 12, 1935, p. 414. — o.c. 21, 1936, p. 454, fig. 50.
Oxyeleotris heterodon Koumans, Zool. Meded. Leiden 19, 1936, p. 132 (in separate print p. 131).
Boroda malua Koumans, o.c. 22, 1940, p. 138 (as synonym).
Oxyeleotris lineolatus Koumans, o.c. 22, 1940, p. 164 (as synonym).
Eleotris immaculatus Koumans, o.c. 22, 1940, p. 174 (as synonym).

D. 1 VI; D. 2 I. 9; A. I. 8-9; P. 18; L.l. 62-65; L.tr. 19-20; Predorsal scales 40-48 (+ 13-16).

Body elongate, anteriorly cylindrical, posteriorly compressed, height $4^1/_2$-$5^1/_2$ in length, $5^1/_2$-7 in total length. Head depressed, $2^3/_4$ in length, $3^1/_3$ in total length. Profile concave. Eye 6-12 in head, interorbital $1^1/_2$-$2^1/_2$ eyediameter. Snout a little longer than eye, tip before middle of eye. Lower jaw prominent. Maxillary extends to below posterior part of eye. Teeth small, in several rows. In upper jaw outer row a little enlarged. In lower jaw outer row in front a little enlarged, laterally inner row enlarged. Head scaled above from between the nostrils, cheek and opercle scaled. Scales of head, nape, breast and belly cycloid, of body ctenoid. First dorsal fin half of height of body, second ray is the longest. Second dorsal fin a little higher than the first. Pectoral fin shorter than postorbital part of head. Ventral fin half of length of head. Caudal fin rounded, as long as postorbital part of head. Colour blackish, belly lighter, indistinctly clouded. Fins darkish or lighter with indistinct darker blotches. Length 480 mm.

Nom. indig.: Kajo (Sentani lake).

Habitat: New Guinea (Sentani lake!, Lorentz river!, branch of Mosso river!, Sepik river!, Mamberano river!, Idenburg river!, Kéremma river, Western Division!). — Australia (Queensland, Cooktown!). — In fresh water.

Types of *Eleotris (Oxyeleotris) heterodon* seen in the Amsterdam Museum, a specimen, probably a cotype of *E. crescens* De Vis, seen in the Australian Museum, Sydney, type and 2 paratypes of *Boroda malua* seen in Field Museum Nat. Hist., Chicago.

Note: The 4 specimens stated by M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 596, as *Eleotris heterodon* from Njao, belong to *O. fimbriatus* (M. Weber).

5. **Oxyeleotris fimbriatus** (M. Weber) (Fig. 87, p. 360)

Eleotris fimbriatus M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 254.
Eleotris (Oxyeleotris) urophthalmoides M. Weber, o.c. p. 255 (not of Blkr.).
Eleotris (Oxyeleotris) aruensis M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 33, pl. 1 fig. 5.
Eleotris (Oxyeleotris) mertoni M. Weber, o.c. p. 33, pl. 2 fig. 3.
Eleotris fimbriatus M. Weber, Nova Guinea 9 Zool. 4, 1913, p. 594, pl. 13 fig. 1.
Eleotris urophthalmoides M. Weber, o.c. p. 596 (not of Blkr.).
Eleotris urophthalmus M. Weber, o.c. p. 596 (pro parte not of Blkr.).
Eleotris (Oxyeleotris) aruensis De Beaufort, Bijdragen Dierkunde 1913, p. 135.
Oxyeleotris aruensis Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 390.
Eleotris fimbriatus Fowler, o.c. p. 393.
Oxyeleotris fimbriatus Koumans, Zool. Meded. 19, 1936, p. 133 (in separate print p. 132).
Oxyeleotris fimbriatus Whitley, Rec. Austral. Mus. 20, 1938, p. 231.

D. 1 VI; D. 2 I. 10-12; A. I. (7) 8-10 (11); P. 14-16; L.l. 45-77;

L.tr. 14-24; Predorsal scales 26-36 (+ 8-12).

Body elongate, anteriorly depressed, posteriorly compressed, height $4^1/_2$-$5^1/_2$ in length, $5^1/_2$-$6^1/_2$ in total length. Head depressed, profile straight, $2^3/_4$-$3^1/_5$ in length, $3^1/_2$-4 in total length. Eye $4^1/_2$-6 in head, interorbital 1-2 eyediameter. Snout a little shorter than eye, to as long as eye, tip before lower margin of eye. Anterior nostrils in short tubes. Lower jaw prominent, mouth oblique. Maxillary extends to below anterior part of eye to middle of eye. Teeth in several rows. In upper jaw outer row a little enlarged. In lower jaw in front outer row enlarged, laterally some teeth of inner row enlarged. A number of mucous canals radiate under eye. Two canals run longitudinally on cheek. Some open pores round the eyes and along posterior margin of preopercle. Head scaled above from before the eyes and on cheek and opercle with cycloid scales. Scales of nape, breast and belly cycloid, of body ctenoid. First dorsal fin much lower than body. Height of second dorsal fin is about $^2/_3$ of height of body. Pectoral fin rounded, as long as head without snout. Ventral fin a little shorter. Caudal fin rounded, as long as pectoral fin. Colour yellowish gray, lighter below. Body with a number of narrow bent transverse bands with the top directed headwards. From below the eye three dark lines radiate to opercle; before the eye a triangular dark blotch. On upper part of caudal fin an indistinct ocellus. Second dorsal and caudal fin spotted. Anal and ventral fin with light border. Length 345 mm.

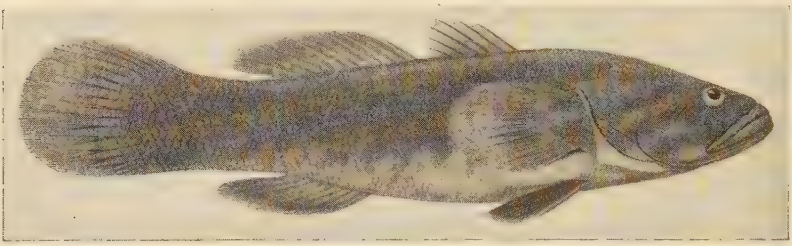

Fig. 87. *Oxyeleotris fimbriatus* (M. Weber). × $^4/_9$. After M. Weber.

Habitat: Waigeu (Wai Meniel!, Beo!); Aru Islands (Terangan!, Kobroor Seltutti!); New Guinea (Kambo Keper!, Mamberano river!, Doorman river!, Idenburg river!, Tawarin river!, mouth of Sermowai river!, Upper Sermowai river!, Njao!, Etna bay!, Wagani river!, Wassi Kursa river Tarara!, Tigi lake!, Paniai lake!, Urumuka river!, Lorentz river!, Noord river!, Alkmaar!, Sabang!, Merauke!, Upper Fly river!).

Types of *Eleotris* (*Oxyeleotris*) *aruensis, E.* (*O*) *mertoni* and type of *E. fimbriatus* seen in the Amsterdam Museum.

Note: The specimens described by M. Weber, Abh. Senckenb. Naturf. Ges. 34, 1911, p. 33, pl. 2 fig. 3, as *Eleotris* (*Oxyeleotris*) *mertoni,* differ from specimens of *O. fimbriatus* of the same length in a lower number of scales in L.l., L.tr. and predorsal region. These specimens I regard as a variety *mertoni.* See Koumans, Zool. Meded. Leiden 19, 1936, p. 134.

Oxyeleotris fimbriatus is a very interesting species, as the number of scales in small and large specimens differs strongly. It seems that the number of scales increases during growth (c.f. Koumans, Temminckia 1, 1936, p. 267-276).

16. **Belobranchus** Bleeker

(Bleeker, Nat. Tijdschr. Ned. Indië 12, 1856, p. 300)

Body elongate, anteriorly cylindrical, covered with about 70 ctenoid scales. Head totally naked. First and sometimes first and second branchiostegal ray form at the lower end a sharp, conical spine. Teeth in several rows, outer row a little enlarged, no canines. Lower jaw prominent. Nostrils not tubulate. Gillopenings not continued forward below, isthmus broad. First dorsal fin with 6 rays. D. 2 and A. I. 7.

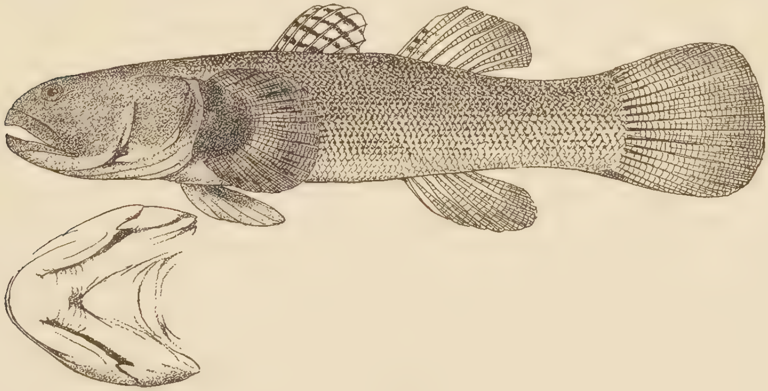

Fig. 88. *Belobranchus belobrancha* (C.V.). × 4/5.

Distribution: Indo-Australian Archipelago and Philippines.

1. **Belobranchus belobrancha** (C.V.) (Fig. 88, p. 361)

Eleotris poecilopterus v. Hasselt in Collection Leiden Museum.
Eleotris belobrancha Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 243.
Eleotris belobrancha Bleeker, Journ. Ind. Arch. 3, 1849, pp. 67, 68.
Belobranchus Quoyi Bleeker, Nat. Tijdschr. Ned. Indië 12, 1856/57, p. 300.
Belobranchus taeniopterus Bleeker, o.c. p. 301.
Eleotris belobrancha Günther, Cat. Fishes 3, 1861, p. 127.
Eleotris taenioptera Günther, o.c. p. 127.
Belobranchus Quoyi Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 53.
?*Eleotris taenioptera* Regan, Ann. Mag. Nat. Hist. (8) 1, 1908, p. 153.
Belobranchus belobrancha Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 35, pl. 2 fig. 2.
Belobranchus taeniopterus Giltay, Mem. Mus. Roy. Hist. Nat. Belgique Hors Serie 5, 1933, p. 88, fig. 26.
Belobranchus belobrancha Aurich, Int. Revue Hydrobiol. u. Hydrograph. 38, 1938, p. 130, fig. 3.

D. 1 VI; D. 2 I. 7; A. I. 7; P. 19-23; L.l. 70; L.tr. 20; Predorsal scales ± 30.

Body elongate, anteriorly cylindrical, posteriorly compressed, height 5-5$^1/_2$ in length, 6-7 in total length. Head depressed, 3-3$^3/_4$ in length, 4-4$^3/_4$ in total length. Frontal profile straight to a little convex. Eye 3$^1/_3$-6$^1/_2$ in head, interorbital $^1/_2$-2 eyediameters. Snout convex, a little shorter than eye to 1$^1/_2$ eyediameter, tip before middle of eye to before inferior margin of eye. Lower jaw prominent. Maxillary extends in young specimens to below middle of eye, in adult to below posterior margin of eye, or to beyond eye. Anterior nostril in a rim. Teeth in front in a few rows, outer row a little enlarged; laterally in one row. In lower jaw unequal, in upper jaw equal. No distinct pores on head. Supraopercular groove distinct. A mucous canal round each eye, continued in the supraopercular groove. Below the eye two branches run longitudinally on cheek. First and sometimes first and second branchiostegal ray form at the lower end a sharp, conical spine. Gillopenings not continued forward below. Head naked, throat naked. Scales of nape, base of pectoral fin and belly cycloid, on body ctenoid. Scales of nape very small. Sixteen scales in a transversal line before base of caudal fin. First dorsal fin obtuse, half of height of body, second, third and fourth rays are the longest. Second dorsal and anal fin a little higher than first dorsal fin, obtuse, rounded. Pectoral fin obtuse, about as long as postorbital part of head, upper rays short, silklike. Ventral fin shorter than pectoral fin. Caudal fin rounded, length of caudal peduncle 2 times its depth. Colour dark to olivous above, dark or yellowish below. Many longitudinal dark stripes on body, following the rows of scales. Finmembranes violet to dusky, rays orange. In young specimens irregular orange transverse stripes or spots. Fins, ventral fins excepted, with dark spots. Dorsal fins and anal fin with longitudinal stripes. Pectoral and caudal fin with transverse stripes. Pectoral fin with dark blotch at upper part of base. In adult body clouded with dark. Fins nearly without spots. First dorsal fin mostly with dark longitudinal band under tip. Sometimes a dark spot at the upper end of caudal peduncle. Length 195 mm.

Habitat: West Nias (Lolowau); Java! (Palabuan Ratu!); Bali (Boleleng); Flores (Bari river!, Wai Ratjang or Wako!); Timor (river Koinino!, Baaguia!, Kupang); Babber (Yer Lawi!); Wetter (Ilmedo!, Meta Sau!); Borneo!; Celebes! (Maros, Menado, Sewangan, Klabatdiatas, Gorontalo!); Batjan (Labuha); Sula Archipelago!; Taliabu (Wai Meha!); Buru (Wae nama!); Ceram (river Riuapa!, river Tubah!, river Samal!); Ambon!, Salawati (Manoi); ?New Guinea (Wedau river). — Philippines. — In rivers and estuaries.

Types of *Eleotris belobrancha* seen in Paris Museum.

17. **Parioglossus** Regan

(Regan, Trans. Linn. Soc. London 2nd Serie Zool. 15 prt. 2, 1912, p. 302)

Body strongly compressed, covered with small scales. Head strongly compressed. Mouth protractile, very oblique. Teeth in premaxillaries on each side with 3 canines of outer row, inner row small. In lower jaw on each side 3-5 canines, lateral teeth smaller, in one row. Gillopenings not continued forward below. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 16-17; A. I. 15-17. Ventral fins I. 4.

Distribution: Indian Ocean to Queensland, 3 species known.

1. **Parioglossus borneensis** nov. spec (Fig. 89, p. 364)

D. 1 VI; D. 2 I. 16; A. I. 16-17; P. 17; V. I. 4; L.l. ± 100.

Body elongate, compressed, height $5^1/_2$ in length, $6^1/_2$ in total length. Head compressed, $4^1/_2$ in length, $5^1/_4$ in total length. Eye

$2^1/_2$ in head, interorbital $^1/_2$ eyediameter. Snout very short, $^1/_3$ eyediameter, tip before upper part of eye. Anterior nostril in a short tube. Mouth nearly vertical, maxillary extends to below anterior margin of eye. Teeth in upper jaw on each side about 3 canines of outer row, inner row small. In lower jaw on each side 3-4 canines, laterally the teeth are smaller. Tongue truncate. Gill-openings not continued forward below, isthmus broad. Around the upper half of each eye about 7 open pores. Along posterior margin of preopercle some open pores. Head naked, body scaled with very small, probably cycloid scales. First dorsal fin much lower than body, middle rays are the longest. Second dorsal and anal fin higher than first dorsal fin, highest in front. Pectoral fin rounded, shorter than eye. Ventral fins separate, each consisting of one spine and 4 soft rays. Caudal fin rounded. Colour in spirits grayish. Vertical fins with minute dark dots. Margins of second dorsal and anal fin hyaline. On lower half of caudal fin near the base an oblong dark blotch. Length 25 mm.

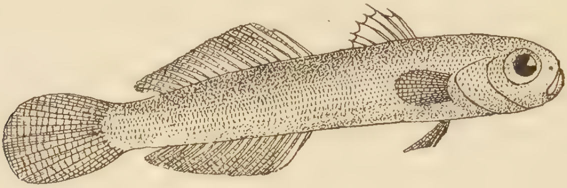

Fig. 89. *Parioglossus borneensis* n.sp. × 3.

Habitat: Borneo (Balikpapan bay!). — Above mangrove vegetation.

The holotype of 25 mm and one paratype of 22 mm are in the Amsterdam Museum. A paratype of 24 mm is in the Leiden Museum.

Note: Of the genus *Parioglossus* one species, *P. taeniatus* Regan, is known from the Indian Ocean, namely Aldabra, see Regan, Trans, Linn. Soc. London 2nd Ser. Zool. 15 prt. 2, 1912, p. 302. The other species, *P. rainfordi* McCulloch, Proc. Linn. Soc. N.S. Wales 46 prt 4, 1921, p. 471, pl. 41 fig. 4, is known from Bowen, Queensland.

18. **Vireosa** Jordan & Snyder

(Jordan & Snyder, Proc. U.S. Nat. Mus. 24, (1901) 1902, p. 38)

Body very elongate, compressed, covered with minute cycloid scales, which are partly embedded. Head naked, blunt. Eye large. Chin with a median barbel, followed by some smaller ones. Mouth nearly vertical. Teeth partly canines. Gillopenings continued forward below, isthmus narrow. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 24-26; A. I. 24. Ventral fins I. 4. Caudal fin with upper and lower rays ending in filaments.

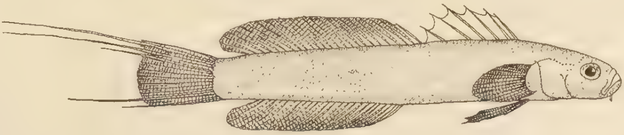

Fig. 90. *Vireosa hanae* Jordan & Snyder. n.s.

Distribution: Japan, Bay of Djakarta. One species known.

1. **Vireosa hanae** Jordan & Snyder (Fig. 90, p. 365)

Vireosa hanae Jordan & Snyder, Proc. U.S. Nat. Mus. 24, (1901) 1902, p. 38, fig. 1.
Vireosa hanae Jordan, Tanaka & Snyder, Journ. Coll. Sci. Univ. Tokyo 33 art. 1, 1913, p. 337, fig. 286.
Vireosa hanae Tomiyama Jap. Journ. Zool. 7 no. 1, 1936, p. 50.
Vireosa hanae Hardenberg, Treubia 17, 1939, p. 122.
Vireosa hanae Koumans, Zool. Meded. Leiden 22, 1940, p. 140.

D. 1 VI; D. 2 I. 24-26; A. I. 24; P. 21; V. I. 4.

Body very elongate, compressed, height $6^1/_2$ in length. Head a little compressed, $5^1/_3$ in length. Eye $3^2/_3$ in head, interorbital 1 eyediameter. Snout shorter than eye, blunt, tip before middle of eye. Anterior nostril in a short tube. Mouth almost vertical, lower jaw prominent. Maxillary extends to a little beyond the vertical from anterior edge of orbit. Teeth in upper jaw in 2 rows; outer row enlarged, of a few canines, inner row small simple teeth. In lower jaw outer row enlarged, of a few canines in front of the jaw, middle row small, inner row enlarged, canines of which the anterior ones are the largest. Tongue slender compressed. Mucous canals: a canal below nostrils along upper jaw, some short canals radiate under eye, a transversal canal behind eye to nape, where it meets the canal from the other side, a transversal canal dorsally from posterior margin of preopercle. An open pore medially of nostrils, one medially in interorbital space, one on each side behind eye, some along posterior margin of preopercle. Gillopenings wide, continued forward below, isthmus narrow. Chin with a large median barbel, about as long as eye, followed in male specimens by 2-3 smaller ones, in female these smaller barbels are absent. Head naked, body scaled with minute, cycloid, partly embedded scales, which are smaller and farther apart anteriorly, larger and more close together posteriorly. Dorsal fins separate. First dorsal fin a little lower than body, middle rays are the longest. The first five rays are close together, the sixth far removed; the membrane of first dorsal fin ends at the insertion of second dorsal fin. Second dorsal and anal fin about as high as body. Pectoral fin as long as, or shorter than head without snout. Ventral fin a little shorter than head. Caudal fin longer than head, the upper rays are prolonged in long filaments, the lower rays are prolonged, but shorter than upper rays. Colour in life after Jordan & Snyder: "In life the upper parts are bluish, becoming green on upper part of head with a shade of violet below the green; a reddish blotch at base of pectoral; lateral band above anal, brick red; the band extending on the caudal, where the reddish color becomes diffused over the fin above and below. Spinous dorsal light blue, with a tinge of pink; violet at base, becoming greenish above; 2 indistinct, narrow, blue lines running horizontally near upper edge of fin; caudal bluish, tinged with red; the filaments greenish; pectorals and ventrals with bluish and greenish tints." Colour in preserved state whitish, a little brownish above. From a little above the insertion of anal fin a light stripe to a little below the middle of base of caudal fin. Body below this stripe yellowish white. Dorsal fins a little dusky. Centre of caudal fin dusky, upper and lower parts lighter, upper filaments pearly white, lower ones dusky. Anal fin light, with a narrow pearly band at base. Pectoral fin with an indistinct crescent-shaped light spot at base. Length 130 mm (caudal filaments excluded).

Habitat: Java (Bay of Djakarta!). — Japan!. — In sea.

Type seen in Stanford University.

19. **Ptereleotris** Gill

(Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 270)

Body elongate, compressed, covered with 150-170 cycloid scales. Head naked. Mouth very oblique, lower jaw prominent. Teeth in several rows, outer row enlarged, partly canines. No barbels Gill-openings wide, isthmus narrow. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 and A. I. 24-32. The rays of dorsal and anal fins are undivided. Ventral fins I. 4. Caudal fin truncate to emarginate.

Distribution: Zanzibar, India to Islands in the South Pacific.

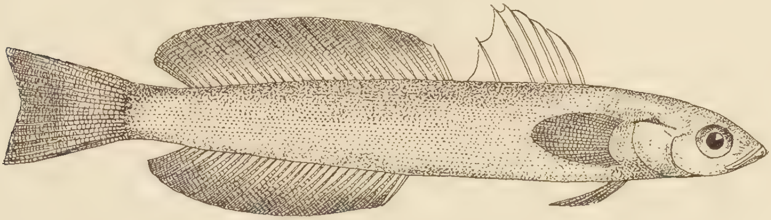

Fig. 91. *Ptereleotris microlepis* (Blkr.). × 1½.

Key to the Indo-Australian species of Ptereleotris

A. D. 2 I. 27; A. I. 27. Base of pectoral fin with bluish stripe below . . . . 1. *P. microlepis* p. 367.
B. D. 2 I. 30; A. I. 29. Base of pectoral fin without dark stripe below. Central part of caudal fin black . . . . 2. *P. heteropterus* p. 368.

1. **Ptereleotris microlepis** (Blkr.) (Fig. 91, p. 367)

Eleotris microlepis Bleeker, Nat. Tijdschr. Ned. Indië 11, 1856, p. 102.
Eleotriodes microlepis Bleeker, o.c. 14, 1857, p. 465.
Eleotris microlepis Günther, Cat. Fishes 3, 1861, p. 132.
Eleotris microlepis Playfair, Fishes Zanzibar 1866, p. 75, pl. 9 fig. 5.
Ptereleotris microlepis Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 103.
Eleotris elongata Alleyne & Macleay, Proc. Linn. Soc. N.S. Wales 1, 1877, p. 335, pl. 13 fig. 1.
Ptereleotris microlepis McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 258, pl. 37 fig. 1.
Ptereleotris playfairi Whitley, o.c. 19, 1933, p. 90.
Ptereleotris microlepis Koumans, Zool. Meded. Leiden 22, 1940, p. 158. — Mem. Indian Mus. 13, 1941, p. 325.

D. 1 VI; D. 2 I. 27; A. I. 27; P. 23; L.l. more than 100.

Body elongate, compressed, height $6^{1}/_{2}$ in length, 8 in total length. Head pointed, compressed, $4^{1}/_{2}$-5 in length, $5^{1}/_{2}$-6 in total length. Eye $3^{1}/_{3}$-$3^{1}/_{2}$ in head, interorbital less than 1 eyediameter. Snout a little shorter than eye, tip before upper part of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below anterior half of eye. Teeth in upper jaw in many rows, outer row enlarged, on each side 4-5 distant canines. In lower jaw teeth anteriorly in some rows, laterally in one row; in front 2-4 canines of outer and inner row. Tongue rounded. Some open pores round the eyes and along posterior margin of preopercle. Head and median part of nape naked. Scales of body very small, cycloid, on posterior part of body a little larger. Dorsal fins nearly continuous. First dorsal fin lower than the second, fifth ray is the longest, sixth ray at some distance from the fifth. Second dorsal fin lower than body. Pectoral fin about as long as head without snout. Ventral fin a little shorter than head. Caudal fin a little longer than head, truncate to emarginate. Colour greenish red above, pearly red below. Snout and cheek with oblong blue spots. Behind eye and on opercle blue stripes, which are a little recurved. Fins yellowish orange. Dorsal fins bordered with purple. First dorsal fin with an oblique stripe. Base of anal fin with a double stripe, the superior bluish, the lower orange. Base of pectoral fin in its lower part with a blue and a bluish violet transverse stripe. Length 120 mm.

Habitat: Pulu Weh!; Nias!; Banda (Neira). — Zanzibar, Mergui Archipelago!, Siam, Darnley Island!, Tuamotus, Society Islands, Christmas Island, Fanning Island.

Type of *Eleotris microlepis* seen in the Leiden Museum, type of *E. elongata* seen in Macleay Museum, Sydney.

2. **Ptereleotris heteropterus** (Blkr.)

Eleotris heteropterus Bleeker, Nat. Tijdschr. Ned. Indië 9, 1855, p. 422.
Eleotriodes heteropterus Bleeker, o.c. 14, 1857, p .465.
Eleotris heteropterus Günther, Cat. Fishes 3, 1861, p. 132.
Ptereleotris heteropterus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 105.

D. 1 VI; D. 2 I. 30; A. I. 29; P. 23-24; L.l. more than 100.

Body elongate, compressed, height $8^1/_2$ in total length. Head pointed, compressed, $5^1/_4$ in total length. Eye 3 in head, interorbital 1 eyediameter. Snout shorter than eye, tip before upper part of eye. Mouth very oblique, lower jaw prominent. Maxillary extends to below anterior margin of eye. Teeth in upper jaw in several rows, outer row enlarged, on each side 3-4 canines. In lower jaw teeth in front in some rows, partly canines, laterally in one row. Head and median part of nape naked. Scales of body very small, deciduous, on posterior part of body a little larger. Dorsal fins nearly continuous. First dorsal fin lower than body, the sixth ray at some distance from the fifth. Second dorsal and anal fin in front higher than posteriorly. Pectoral and ventral fin shorter than head without snout. Caudal fin emarginate, shorter than head. Colour greenish red above, pearly below. Fins weak orange. Central part of caudal fin black. Length 49 mm.

Habitat: Borneo (Bandjermasin!).

Type seen in the Leiden Museum.

20. **Nemateleotris** Fowler

(Fowler, Proc. U.S. Nat. Mus. 85, 1938, p. 131)

Body elongate, well compressed, scales ctenoid, in predorsal, chest and breast very small, large on prepectoral and on tail posteriorly. Head small, compressed. Snout very short, obtuse. Eye large, interorbital broad. Mouth moderate, lower jaw a little prominent. Maxillary extends to below eye. Teeth uniserial, large, simple, well spaced. Gillopenings lateral, oblique, isthmus broad. Dorsal fins separate. First dorsal fin with 6 rays, the first of which is prolonged into a filament. D. 2 I. 28; A. I. 24. Caudal fin rather large, pointed.

Distribution: Celebes. One species known.

1. **Nemateleotris magnificus** Fowler

Nemateleotris magnificus Fowler, Proc. U.S. Nat. Mus. 85, 1938, p. 132.

D. 1 VI; D. 2 I. 28; A. I. 24; P. 17; V. I. 5; L.l. 108 + 10; L.tr. 27.

Body elongate, compressed, height 5 in length. Head $4^1/_4$ in length. Eye 3 in head, interorbital 1 eyediameter. Snout 5 in head. Mouth oblique, maxillary extends to below anterior third of eye. Teeth strong, sharp pointed, about 20 in each jaw. Scales very small on front sides of back, chest, breast and belly. Caudal base scaly, other fins naked. First ray of first dorsal fin prolonged into a filament, which reaches base of last ray. Caudal fin $3^1/_3$ in length, pointed. Pectoral fin $1^1/_{10}$ in head. Ventral fin as long as head. Colour light brown, a little paler to whitish on under surface of head and belly. Dorsal fins and anal fin whitish, filament grayish. Second dorsal fin with gray black upper border, each membrane a little above the middle with a large black blotch, convex above, concave below. On each membrane on basal area 3-6 small dark gray round spots. Anal fin with lower border gray black, above which a band, made up of black ocellate spots, one on each membrane. Caudal fin pale basally, blackish above and below, an oblique black bar converging medially is behind each lobe. Pectoral and ventral fin dull brown. Length 61 mm.

Habitat: Celebes (Tomini Gulf Buka Buka Island).

After Fowler, not seen by us.

21. **Orthostomus** Kner

(Kner, Sitz. ber. Ak. Wiss. Wien 58, 1868, p. 29)
Stomogobius Whitley, Australian Zoologist 6, 1931, p. 334 (substitute name).

Body elongate, compressed, covered with small ctenoid scales. Head deep, compressed, scaled above. Mouth subvertical, lower jaw prominent. Teeth fine, in front 4 canines. Gillopenings wide, continued forward below, isthmus narrow. Dorsal fins separate. First dorsal fin with 6 rays. D. 2 I. 29; A. I. 29. Caudal fin rounded.

Distribution: Singapore. One species known.

1. **Orthostomus amblyopinus** Kner (Fig. 92, p. 371)

Orthostomus amblyopinus Kner, Sitz. ber. Ak. Wiss. Wien 58, 1868, p. 330, pl. 6 fig. 16.
Orthostomus amblyopinus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 107.

D. 1 VI; D. 2 I. 29; A. I. 29; P. 18; V. I. 4.

Description after Kner: "Die Körperhöhe der Kopflänge und diese $1/5$ der Körperlänge gleich, das Auge $1/3$ der Kopflänge; Farbung hell bräunlich-gelb (vielleicht im Leben rosenroth) mit Silberstrichen und Flecken an den Seiten des Kopfes. Der Kopf ist zufolge der fast senkrechten Mundspalte beinahe vertical abgestutzt und die Symphyse des Unterkiefers ragt vor; von den vier stärkeren und längeren Fangzähnen beider Kiefer stehen die zwei inneren im unteren ganz am Rande fast wagrecht und nach vor- und aufwärts gekrümmt, die beiden äusseren nach vorne convexen sind aufrecht; die vier Fangzähne des Zwischenkiefers kleiner, kaum gebogen und mehr nach vorne als nach abwärts gerichtet, der Gaumen ist zahnlos, eine freie Zunge fehlt. Das Auge ist nur $2/3$ seines Durchmessers von der Symphyse und blosz über $1/2$ vom anderen Auge entfernt; die Nasenbeine laufen vorne in je eine kurze Dorn-

spitze aus, zwischen denen der dreieckige Stiel des Zwischenkiefers sich einschiebt, der bis zwischen die Augen reichend, daselbst eine tiefe Grube bildet. Der schief stehende Vordeckel ist unbewaffnet, nur vom hinteren Rande des Deckels ragt am Winkel ein kleiner flacher Dorn vor. Die Deckelstücke sind übrigens zu kurz und klein, um über die ganze grosze Kiemenspalte zu reichen, ein Theil der Kiemenhaut und Kiemenstrahlen ragt daher unter und hinter ihnen frei vor, da sie bis an die Kehle offen ist. Die erste Dorsale ist wie bei Gobius und Eleotris völlig von der zweiten getrennt und die mittleren und längsten ihrer einfachen, biegsamen Strahlen erreichen fast Körperhöhe und kommen den längsten in der hinteren Hälfte der zweiten Dorsale fast gleich. Die letzten Strahlen der zweiten Dorsale und auch der Anale reichen zurückgelegt bis auf die Basis der Caudale und lassen daher den Schwanzstiel flossenfrei. Die Analpapille liegt fast genau in halber Körperlänge. Die Caudale ist zwar verletzt, scheint aber schief von oben nach unten und vorwärts abgestutzt und kaum von Kopfeslänge zu sein. Eben so lang sind die Brustflossen, die bis unter das Ende der ersten Dorsale reichen und wie bei Periophthalmus auf einer breiten musculösen und überschuppten Basis aufsitzen; die unter ihnen eingelenkten, zugespitzten Ventralen erreichen beinahe die Analgrübe. — Die Beschuppung beginnt am Kopfe unmittelbar hinter den Augen und daselbst liegen bis zur ersten Dorsale die kleinsten Schuppen, nur wenig grössere bedecken die Basis der Brustflossen und den Bauch, grössere die Seiten des Rumpfes, die grössten liegen seitlich am freien Schwanzstiele; die Caudale und alle übrigen Flossen sind unbeschuppt; die Rechenzähne der

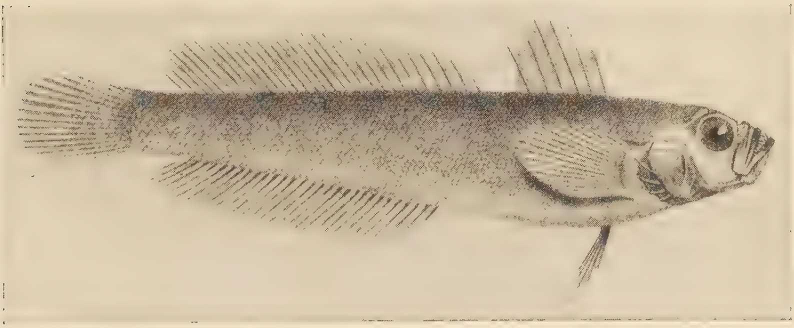

Fig. 92. *Orthostomus amblyopinus* Kner. × 4. After Kner.

Kiemenbögen sind ansehnlich lang. — Die Rückenseite dunkler als der Bauch, alle Flossen durchscheinend. An den Wangen über dem unteren Rande des Vordeckels ein Silberstrich, oberhalb ein kürzerer vom Suborbitalring bis an den Rand des Oberkiefers, ein kleiner Silberfleck am vorderen Augenrande, 1-2 hinter dem Auge und noch 1-2 längliche auf dem Deckel selbst und dem hinabgezogenen Unterdeckel." Length 25 mm.

Habitat: Singapore.

Not seen by us.

Note: It seems questionable whether this genus belongs to Gobioidea. The small spine on opercle may indicate that this species belongs to another group.

22. **Oxymetopon** Bleeker

(Bleeker, Nat. Tijdschr. Ned. Indië 22, 1861, p. 258)

Body elongate, very compressed, covered with about 100 deciduous ctenoid scales. Head obtuse, nape with a scaled crest. Mouth very oblique, lower jaw prominent. Teeth in several rows, outer row enlarged; in both jaws in front 4 canines. Gillopenings continued forward below, isthmus narrow. Dorsal fins nearly continuous. First dorsal fin with 6 rays. D. 2 and A. I. 31. All rays of second dorsal and anal fin simple. Ventral fins I. 4. Caudal fin lanceolate.

Distribution: Timor, West Java. One species known.

1. **Oxymetopon typus** Blkr. (Fig. 93, p. 373)

Oxymetopon typus Bleeker, Nat. Tijdschr. Ned. Indië 22, 1861, p. 259.
Oxymetopon typus Günther, Cat. Fishes 3, 1861, p. 153.
Oxymetopon typus Bleeker, Versl. Ak. Amsterdam (2) 11, 1877, p. 109.

D. 1 VI; D. 2 I. 31; A. I. 31; P. 20-21; V. I. 4; L.l. ± 105.

Body elongate, very compressed, height $5^1/_4$ in length, $7^1/_2$ in total length. Head 9 ($5^3/_4$) in length, ($7^1/_2$ in total length), higher than long. On dorsal median line a scaled fleshy crest. Profile concave before the eyes, strongly convex behind the eyes. Eye (3) $3^1/_4$ in head, interorbital ($^1/_2$) 1 eyediameter. Snout very short. Mouth very oblique, lower jaw prominent. Maxillary extends to below anterior half of eye. Teeth of outer row in upper jaw enlarged, in front 4 canines, inner rows small. In lower jaw 2 canines before and 2 behind the symphysis. Scales ctenoid (before first dorsal fin cycloid), becoming larger towards the posterior part of body. Dorsal fins with their bases continuous. First dorsal fin a little lower than body, second ray is the longest, sixth ray at some distance from the fifth. Second dorsal fin half as high as the first. Anal fin a little lower than second dorsal fin. Pectoral fin rounded. Ventral fin pointed, both fins about as long as head. Caudal fin lanceolate, longer than head, median rays prolonged into filaments. Colour reddish to greenish red above, pearly below. Cheek with 2 oblique blue streaks. Dorsal fins reddish with 3-4 blue longitudinal lines. Pectoral fin yellowish red, base carmine with short blue streaks. Ventral fin orange. Anal fin violet. Caudal fin orange red with small bluish ocelli between the rays. Length 159 mm.

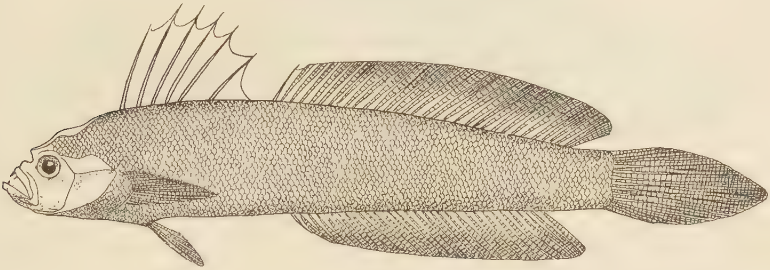

Fig. 93. *Oxymetopon typus* Blkr. × $^3/_4$.

Habitat: Krakatau!; West Java (Tji prage!); Timor (Kupang!).

Type seen in the Leiden Museum.

Note: The characters in parentheses are taken from a specimen of 90 mm, collected by Dr. J. D. F. Hardenberg on Dec. 11, 1930 at Tji prage.

23. **Mogurnda** Gill

(Gill, Proc. Ac. Nat. Sci. Philadelphia 1863, p. 270)

Krefftius Ogilby, Proc. Linn. Soc. N.S. Wales 21, 1897, p. 736.

Body elongate, compressed, covered with 30-40 ctenoid scales. Head large and broad, scaled in front to posterior nostrils, on cheek and opercle. Mouth moderate, oblique, lower jaw prominent. Teeth in several rows. Tongue rounded. Gillopenings a little continued forward below, isthmus moderate. Dorsal fins separate. First dorsal fin with 7-9 rays. D. 2 I. 8-14; A. I. 8-15. Caudal fin rounded.

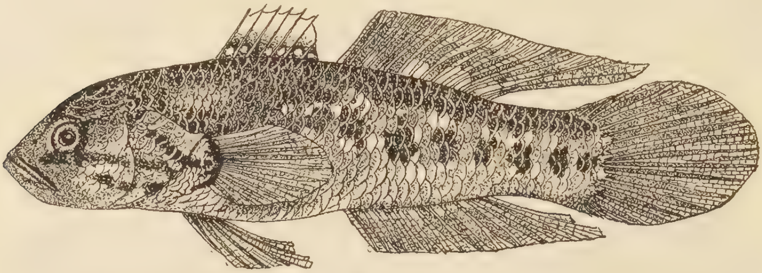

Fig. 94. *Mogurnda mogurnda mogurnda* (Rich.). After M. Weber.

Distribution: Aru Islands, New Guinea, Australia.

Note: Of the species *Mogurnda mogurnda* (Rich.) two subspecies are known, *M. mogurnda adspersus* Castelnau and *M. mogurnda mogurnda* (Rich.). The first named is distributed only in Australia. *M. mogurnda mogurnda* occurs in North and Central Australia, Aru Islands and New Guinea.

1. **Mogurnda mogurnda mogurnda** (Rich.) (Fig. 94, p. 374)

Eleotris mogurnda Richardson, Voy. Erebus & Terror 1844, p. 4, pl. 2 figs. 1, 2.
Eleotris mogurnda Günther, Cat. Fishes 3, 1861, p. 111.
Eleotris spec. M. Weber in Semon, Zool. Forschungsreisen 5, 1895, p. 270.
Eleotris larapintae Zietz, Rept. Horn Sci. Exp. C. Austr. 2, 1896, p. 179, pl. 16 fig. 4.
Eleotris mogurnda M. Weber, Nova Guinea 5 Zool. 2, 1908, p. 253. — Abh. Senckenb. Naturf. Ges. 34, 1911, p. 34, pl. 1 fig. 1. — Nova Guinea 9 Zool. 4, 1913, p. 593.
Mogurnda mogurnda McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 280 (see for synonyms and subspecies).
Mogurnda mogurnda Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 391.
Mogurnda mogurnda Herre, Field Mus. Nat. Hist. Zool. 21, 1936, p. 453.
Mogurnda aurifodinae Whitley, Rec. Austral. Mus 20, 1938, p. 233. — o.c. 20, 1939, p. 276.
Eleotris larapintae Koumans, Zool. Meded. Leiden 22, 1940, p. 173 (as synonym).

D. 1 VII-IX; D. 2 I. 12-14; A. I. 11-15; P. 16; L.l. 38-48; L.tr. 15-16; Predorsal scales 18-20.

Body elongate, compressed, height $3^1/_2$-4 in length, $4^1/_2$-5 in total length. Head blunt, compressed, 3-3$^1/_2$ in length, 4-4$^1/_2$ in total. length. Profile convex to concave. Eye 4-5 in head, interorbital about 2 eyediameters. Snout blunt, a little longer than eye, tip before middle of eye. Mouth oblique, lower jaw prominent. Maxillary extends to below anterior part of eye. Anterior nostril in a short tube. Teeth in a band, outer row enlarged. Tongue rounded. Gill-opening a little continued forward below, isthmus moderate. A mucous canal from above the nostrils over eye to supraopercular groove. Two longitudinal mucous canals on cheek. In some specimens a number of short mucous canals radiate under eye.

Head scaled with cycloid scales from before the eye, on cheek and opercle. Anterior border of snout naked. Scales of body ctenoid. First dorsal fin low, penultimate ray the longest. Second dorsal and anal fin higher, posterior rays are the longest, pectoral fin as long as head without snout. Ventral fin about as long as pectoral fin, inner rays are the longest. Caudal fin rounded, a little shorter than head. Colour light brown, belly lighter. Body with numerous dark spots in the middle of the side, sometimes over these spots transversal bands on the back to middle of the side. In some specimens dorsal and ventral of the row of spots along the middle of the side some longitudinal rows of red spots. Two oblique stripes from eye over cheek to opercle, above these lines a third from opercle to base of pectoral fin. Pectoral fin with a dark transversal line at the base of the rays; sometimes a large dark spot on upper half of base of pectoral fin. First dorsal fin dusky with red spots at the base of the rays, margin white. Second dorsal fin dusky with some large red spots at the base and some along the posterior margin, outer margin white. Anal fin dusky, of the same colour as second dorsal fin. Caudal fin dusky with dark spots between the rays. Length 170 mm.

Habitat: Aru Islands (Fenua borri!, Sungei Manumbai!, Seltutti Kobroor, Terangan); New Guinea (Alkmaar!, Sabang!, Merauke river!, Pandanus creek!, Noord river!, Wagani river!, Lorentz river!, Mamberano river!, Idenburg river!, Beaufort river, Mimika river, Doorman river!, Saltspring at Begowre!, Digul!, Fly river!, Wassi Kurza river Tarara!, Finsch Harbour!). — North and Central Australia (Finke river!).

Types of *Eleotris mogurnda* seen in British Museum (N.H.), types of *E. larapintae* seen in South Australian Museum, Adelaide.

Note: Two specimens from Sabang, New Guinea Expedition 1907, of 139 and 144 mm, show L.l. 52; L.tr. 17; D. 1 VIII; D. 2 I. 12-13; A. I. 11-14; Predorsal scales 19. Further they agree with *Mogurnda m. mogurnda.* One specimen from Alkmaar, New Guinea, shows A. I. 15. Twelve young specimens of 28-45 mm, from Prauwenbivak, Idenburg river, New Guinea, show D. 2 I. 11; A. I. 8-9; L.l. 32-35; L. tr. about 11. Head scaled in front to posterior nostrils The transversal bands on body are connected by a longitudinal band, running from snout to tail. Eighteen specimens of 36-60 mm, from Doorman river, New Guinea, show the same characters. In their characters these specimens therefore show great affinity to *Mogurnda m. adspersus,* which subspecies has D. 1 VI-IX; A. I. 10-13; L.l. 30-35; L.tr. 11-14; Predorsal scales 18-20.

4. Family RHYACICHTHYIDAE

Gobioidea with widely separated ventral fins. Two dorsal fins, far apart. Body subcylindrical anteriorly, compressed posteriorly. Scales ctenoid. Mouth small, inferior.

Distribution: Philippines, Indo-Australian Archipelago, Solomon Islands. A single species known.

1. **Rhyacichthys** Boulenger

(Boulenger, Ann. Mag. Nat. Hist. (7) 8, 1901, p. 267)

Platyptera (Kuhl & v. Hasselt) Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 321 (preoccupied by Meigen, 1803).

For diagnosis and distribution see the family.

1. **Rhyacichthys aspro** (C.V.) (Fig. 95, p. 377)

Platyptera melanocephala (K. & v. H. M.S.) Cuvier, Règne Animal 2nd ed. 2, 1829, p. 248 (nomen nudum).

Platyptera trigonocephala (K. & v. H. M.S.)Cuvier, o.c. p. 248 (nomen nudum).

Platyptera aspro (K. & v. H.) Cuvier & Valenciennes, Hist. Nat. Poissons 12, 1837, p. 321.

Platyptera aspro Günther, Cat. Fishes 3, 1861, p. 138.

?*Platyptera sinensis* Bleeker, Ned. Tijdschr. Dierkunde 4, 1873, pp. 127, 152.

Rhiacichthys novae-guineae Boulenger, Proc. Zool. Soc. London 1903 vol. 2, p. 124, pl. 11.

Rhiacichthys aspro De Beaufort, Bijdragen Dierkunde 1913, p. 137.

Rhiacichthys aspro M. Weber, o.c. p. 213. — Nova Guinea 9 Zool. 4, 1913, p. 599.
Rhyacichthys aspro Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 22, pl. 1 fig. 1.
Rhiacichthys aspro Fowler, Mem. B.P. Bishop Mus. 10, 1928, p. 388.

D. 1 VII; D. 2 I. 8-9; A. I. 8-9; P. 21-22; L.l. 36-40; L.tr. 10-11; Predorsal scales ± 20.

Body depressed anteriorly, compressed posteriorly, height $4^{2}/_{3}$-$5^{1}/_{2}$ in length, $5^{3}/_{4}$-$6^{1}/_{2}$ in total length. Head depressed, about equal to height. Frontal profile straight. Eye about 4-7 in head, interorbital a little broader than eyediameter. Snout 2-3 eyediameters, tip below inferior margin of eye. Mouth small, inferior, upper jaw prominent. Upper lip fleshy. Maxillary extends to halfway snout. Teeth in many rows, outer a little enlarged. Tongue pointed. Head scaled above from a little behind eye, some scales at upper part of cheek behind eye, upper half of opercle scaled. Scales of head and body ctenoid. A lateral line begins behind eye, runs over pectoral to caudal fin. First dorsal fin lower than body, second and third rays are the longest. Second dorsal fin lower than body. Anal fin higher than body. Pectoral fin very large, formed as in Scorpaenidae and Cottidae. Ventral fins widely separated. Belly very flat. Caudal fin lunulate, about as long as head. Colour brown to yel-

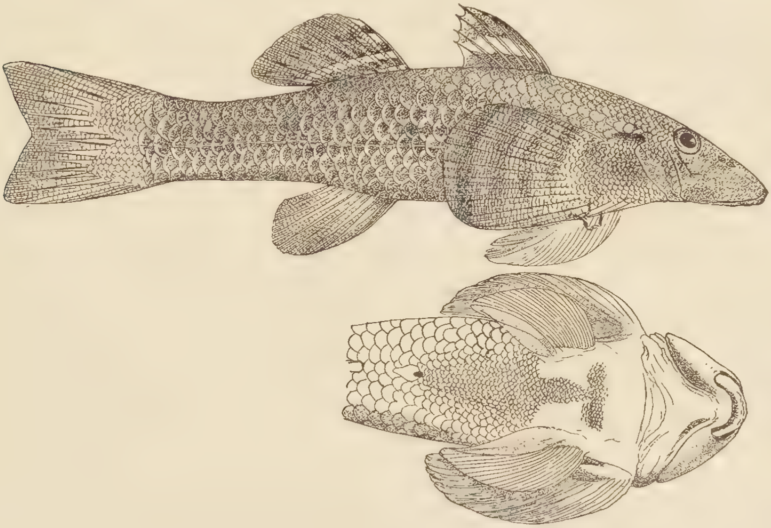

Fig. 95. *Rhyacichthys aspro* (C.V.). × $^{5}/_{8}$.

lowish, sometimes laterally with dark blotches. First dorsal fin with dark band near base between first and fourth rays, margin dark. Second dorsal fin with 3 black bands. Pectoral and ventral fin with transverse bars. Length 225 mm.

Nom. indig.: Salusur (Tjikadjang), Kawatu, Takawatu (Barréö).

Habitat: Sumatra (Trussan, Pàdang); Java (Bantam!, Tjikaengan near Tjikadjang!, Zand bay!, dessa Sapuran!, dessa Wonosobo!, Kali Mandiku!, Kali Bermali!), Bali; Celebes! (Menado, Sawangan, Klabatdiatas, river near Balangnipa, river Tentena!); Buru (Wae nama!); Ceram (river Eme!); Ambon!; New Guinea (saltspring at Begowra river, Dinawa Owen Stanley Range 4000 feet!). — Philippines, Solomon Islands.

Type specimen of *Platyptera aspro* from Celebes, Quoy & Gaimard, seen in Paris Museum, types of *Rhiacichthys novae-guineae* seen in British Museum (N.H.).

SPECIES INCERTAE

There are a number of described species of Gobioidea of which the description is too vague to decide what is meant with such a species. Therefore it is very difficult to place them into a genus. On the other hand some species are recorded from the Indo-Australian Archipelago of which the identification of the specimens, or the cited locality are doubtful. Such species are listed below, stating their characters as far as possible.

Finely a few publications give so many records of species, which are not otherwise known from the Indo-Australian Archipelago, and of which no data are given, that the identification is too improbable to be considered seriously. Among these papers I name A. Borodin, Bull. Vanderbilt Marine Mus. 1 art. 3, 1932, and A. B. Meyer, Anal. Soc. Esp. Hist. Nat. 14, 1885.

Gobius Kuhlii Bleeker, Nat. Tijdschr. Ned. Indië 1, 1850, p. 251, fig. 9.

D. 1. V; D. 2 I. 9; A. I. 10; P. 15?; L.l. ± 30.

Body elongate, height 8 in total length. Head obtuse convex, $4^2/_3$ in total length. Eye 5 in head. Snout obtuse, with papillae. Jaws equal, no canines. Maxillary extends to below anterior margin of eye. First dorsal fin a little lower than body. Second dorsal fin a little lower than the first, pointed posteriorly. Anal fin similar to second dorsal fin. Pectoral fin obtuse, much shorter than head, but longer than ventral fin. Caudal fin obtusely rounded, 7 in total length. Colour of body and fins yellowish. Tail orange below. Vertical fins with dusky margins. Length 55 mm.

Habitat: Java (Menes in river Tjiurang).

Note: Described after a figure of Kuhl & v. Hasselt. Perhaps a *Ctenogobius*?.

Gobius modestus Bleeker, Verh. Bat. Gen. 22, 1849, p. 28.

D. 1 VI; D. 2 I. 11; A. I. 10; P. 19; L.l. 28.

Body elongate, anteriorly cylindrical, posteriorly compressed, height $6^1/_2$ in total length. Head obtuse convex, $4^1/_3$ in total length. Eye 4 in head, interorbital narrow. Teeth in many rows, outer enlarged. In lower jaw laterally 2 canines. Mouth curved, maxillary extends to below anterior margin of eye. Scales of head small. First dorsal fin a little lower than body. Second dorsal and anal fin a little pointed. Pectoral and ventral fin 6 in total length. Caudal fin obtuse, rounded, 5 in total length. Colour of body and fins green, belly whitish. Length 61 mm.

Nom. indig.: Ikan puntang (Jav. Surabaja).

Habitat: Java (Surabaja). — In estuaries.

Type lost.

Note: Probably an *Acentrogobius*.

Gobius baliuroides Bleeker, Verh. Bat. Gen. 22, 1849, p. 26.
Gobius baliuroides Günther, Cat. Fishes 3, 1861, p. 42.

D. 1 VI; D. 2 I. 10; A. I. 10; P. 16; L.l. 25?.

Body elongate, compressed, height 7 in total length. Head obtuse, $4^1/_2$ in total length. Eye 3 in head, interorbital narrow. Mouth oblique, maxillary extends to below anterior margin of eye. Teeth filiform in many rows, outer row enlarged. In lower jaw 2 small canines. First dorsal fin about as high as body. Second dorsal and anal fin pointed. Pectoral fin 5 in total length. Ventral fin 6 in total length. Caudal fin obtuse, $4^1/_2$ in total length. Colour dusky, a black spot on middle of side near base of caudal fin. Length 57 mm.

Habitat: Madura (Sumanep). — In estuaries.

Type lost. A doubtful species.

Note: Some authors have published upon specimens, stating for them the name *baliuroides*. The specimens *Gobius* (*baliuroides* Blkr?) M. Weber, Zool. Ergebnisse 3, 1894, p. 413, from Flores, belong to *Stiphodon elegans* (Steind.). *Rhinogobius baliuroides* Jordan & Richardson, Bull. Bur. Fisheries 27, (1907) 1908, p. 277, from Luzon, and Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 188, from the Philippines, belong to *Acentrogobius reichei* (Blkr.). *Rhinogobius baliuroides* Fowler, Proc. Ac. Nat. Sci. Philadelphia 86, 1934, p. 82, from Den Pasar, Bali, belongs to *Ctenogobius criniger* (C.V.). *Ctenogobius baliuroides* Herre, Bull. Raffles Mus. 13, 1937, p. 43, from Singapore, belongs to *Acentrogobius reichei* (Blkr.) See Koumans, Zool. Meded. Leiden 18, 1935, pp. 142, 143 and o.c. 22, 1940, pp. 135, 156, 187.

Gobius zelei Sauvage, Bull. Soc. Philom Paris (7) 4, 1880, p. 223.

D. 1 VI; D. 2 I. 9; A. I. 9; L.l. 30; L.tr. 12.

Height of body a little more than 7 in total length. Head 4 in total length, depressed. Interorbital space 4 in length of head. Snout pointed, depressed, a little longer than eye. Lower jaw prominent. Maxillary extends to below middle of eye. Teeth in upper jaw of outer row long and curved. In lower jaw on each side 2 canines. No mucous canals on head. Head totally naked. Dorsal fins separate. First dorsal fin has a distance from eye which is larger than the distance from tip of snout to margin of preopercle. Upper rays of pectoral fin not silklike. Caudal fin rounded. Ventral fin ending far before anal fin. Length 75 mm.

Habitat: Celebes (Makassar).

Note: According to Sauvage "Très voisine du *Gobius gymnauchen* Blkr, cette espèce en diffère par l'écartement des dorsales, le non prolongement de la seconde épine dorsale, le plus grand nombre d'écailles à la ligne latérale. Le *Gobius madagascariensis*, Blkr., a un bien plus grand nombre d'écailles dans une rangée transversale." We do not know what may be meant with this species.

Gobius sella (Heckel M.S.) Steindachner, Sitz. ber. Ak. Wiss. Wien 83, 1881, p. 212.

D. 1 VI; D. 2 I. 7; A. I. 9; L.l. ± 27-28; L.tr. 7.

Body elongate. Head about 3 in length (or total length?), height of body less than 4 in length (or total length?). Mouth tolerably long, oblique, lower jaw prominent. End of mandibulary extends to below middle of eye or a little farther. Teeth very small. Head above scaled to middle of front and opercle with pretty large scales. Scales of body large, ctenoid, brown. A blackish narrow band from base of foremost rays of first dorsal vertically to below middle of the side. A black blotch at the base of middle caudal rays. Caudal fin with weak, brown spots.

Habitat: Borneo.

Note: This species probably belongs to *Stigmatogobius*.

Lophogobius wera Popta, Zool. Meded. Leiden 7, 1922, p. 27.

D. 1 VI; D. 2 I. 7; A. I. 7; P. 18; L.l. 26; L.tr. 7; Predorsal scales 8.

Body elongate, a little compressed, height of body $4^4/_{11}$ in total length. Head compressed, $4^4/_{11}$ in total length. Eye $3^2/_3$ in head, interorbital $^1/_6$ eyediameter. Snout $4^2/_5$ in head. Nostrils in short tubes. Upper jaw a little prominent. Maxillary extends to below posterior margin of eye. Teeth in a band, outer row enlarged. Head scaled above behind eye and on opercle. Breast and base of pectoral fin scaly. Scales of body ctenoid. Second dorsal and anal fin $^8/_{11}$ of height of body. Caudal fin shorter than head, rounded. Pectoral fin rounded. Colour greenish yellow. Two dark brown bands from eye to maxillary. From end of upper jaw 2 dark brown bands obliquely upwards on opercle. A darkbrown spot over beginning of pectoral fin. Laterally on body 6 darkbrown longitudinal stripes, between the first and second, and between the third and fourth, there are 2-3 short transversal stripes. Second dorsal fin with 2 darkbrown longitudinal bands. Caudal fin with 6 irregular transverse bands. Pectoral fin greenish yellow. Ventral and anal fin with broad darkbrown margin. Length 48 mm.

Habitat: Sumbawa (Wera river).

Not seen by us, after Popta.

Note: This species probably belongs to *Stigmatogobius*.

Gobius Beccarii Perugia, Ann. Mus. Civ. Genova 32 (2a Ser. 12), 1892, p. 1010.
Gobius Beccarii Vinciguerra, o.c. 50 (3a Ser. 10), 1926, p. 542.

According to Perugia:

"D 6-$^1/_8$ A. 8. L. lat. 26. L'altezza del corpo è il quarto della lunghezza totale (caudale esclusa); la lunghezza del capo ne è il terzo. Il capo è più alto che largo, con il profilo superiore che sale rapidamente. L'occhio, situato verso la parte anteriore del capo, è grande, il suo diametro è uguale allo spazio interorbitale ed è il quinto della lunghezza del capo. Anche la bocca è grande ed il mascellare si estende fino al margine posteriore dell' occhio; essa è armata da minuti denti, quelli della serie esterna più forti; ma non vi si riscontrano canini. La prima dorsale è più bassa della seconda, essendo circa la metà dell' altezza del corpo. Il colore è giallastro, con una stretta fascia bruna sotto la prima dorsale, che non si estende oltre la linea laterale. Alla base della caudale vedesi una piccola macchia nera. Lunghezza degli esemplari cent. 6."

Nom. indig. Ikan Tangion (Sarawak).

Habitat: Borneo (Sarawak).

Gobius Modiglianii Perugia, Ann. Mus. Civ. Genova 33 (2a Ser. 13), 1893, p. 252.

According to Perugia:

„D. 6-11 A. $^1/_8$ Ll. 30 Kifa-juc (Engano). L'altezza del corpo è il quinto della lunghezza totale ed in questa il capo è contenuto 3 volte; esso è notevolmente più lungo che alto. Lo spazio interorbitale è molto stretto, cioè la meta del diametro dell' occhio, il quale è uguale alla lunghezza del muso. La mascella inferiore è più lunga della superiore ed ha una serie esterna di denti orti ed un canino par lato, nel mentre nella superiore i denti sono tutti minuti. La prima dorsale è uguale in altezza alla seconda, entrambi alte quanto il corpo. La pettorale non ha raggi liberi ed è lunga quasi quarto il capo. La caudale non è allungata e chiusa termina in punta. Il colore è bruno marmorato di bruno nerastro: muso nero, due sottili fascie nere partono l'una dall' angolo della bocca alla base della pettorale, l'altra dalla metà dell' orbita alla parte superiore di quella. La sola specie di *Gobius* alla quale questi nostri esemplari si avvicinano per il loro colore è il *G. frenatus* Günther (Cat. fish. III, p. 39), ma questo non è indicato che dall' Australia; inoltre nei nostri esemplari si riscontra minor numero di squama alla linea laterale, due raggi di meno alla seconda dorsale e maggiore altezza del corpo. Credo quindi poterla titenere come specie diversa dal *frenatus*."

Habitat: Engano (Kifa-juc).

Gobius rhombomaculatus Karoli, Termeszetrajzi Füzetek 5, 1882, p. 165.

D. 1 V; D. 2 I. 7; A. I. 7; P. 16; L.l. 30.

Body subelongate, compressed, height 5 in length (or total length?). Head obtuse, depressed, about $4^2/_3$ in length of body. Eye 3 in head, interorbital $^2/_3$ eyediameter. Snout obtuse depressed, shorter than eye. Mouth oblique, extends to below anterior margin of eye. Jaws equal. Teeth small, in one row. Supraopercular groove distinct. Scales large. Vertical fins equal of height, lower than body, without prolonged rays. First dorsal fin rounded, middle rays are the longest. Second dorsal fin pointed. Pectoral and ventral fin pointed. Caudal fin rounded, $4^1/_2$ in length of body. Colour yellowish. On the sides of body 6 rhomboid, blackish, oblique blotches. Fins yellowish. First dorsal fin with black longitudinal stripe. Second dorsal fin with longitudinal rows of black spots. Anal fin violet. Pectoral and caudal fin with black spots. Ventral fins yellowish. Length 60 mm.

Habitat: Borneo (river Santabug).

After Karoli, not seen by us.

Gobius melanopus Bleeker, Nat. Tijdschr. Ned. Indië 20, 1859-1860, p. 456.

Description according to Bleeker:

"Gob. corpore elongato, altitudine $7^1/_2$ ad 8 in ejus longitudine; capite obtuso, convexo; pinna caudali obtusa rotundata; colore corpore viridi; capite maculis sparsis rubro-violaceis; corpore fasciis 6 latis transversis obliquis rubro-violaceis; pinnis dorsalibus viridibus ocellis rubro-violaceis coeruleo limbatis; pinnis pectoralibus aurantiacis; ventrali viridi vittulis rubro-violaceis, apice nigra; anali tota violaceo-nigra; caudali aurantiaca ocellis rubro-violaceis."

Habitat: Singapore.

Note: Bleeker made this description after a drawing by Castelnau. Bleeker presumes that the species belongs to *Acentrogobius.*

Gobiosoma pallida Herre, Notes on Fishes of Stanford University 1, 1934, p. 91.

Gobiosoma pallida Koumans, Zool. Meded. Leiden 22, 1940, p. 149 (examination of the type).

D. 1 VI; D. 2 I. 12; A. I. 12; L.l. ± 24.

Body slender, elongate, height 6.6 in length. Head 3.7 in length. Snout 3.66 in head. Eye 3.92 in head, the inner margins are touching. Mouth slightly oblique. Maxillary extends to below middle of eye. Teeth minute, 4 rows anteriorly in the jaws. Body scaled with about 24 very deciduous, cycloid scales. Dorsal fins very close together. Fourth and fifth rays of first dorsal fin filiform. Second dorsal fin rather low, anal fin similar, but lower. Pectoral fin broad, 4.55 in length. Ventral fin large, 4.1 in length, and extends to origin of anal fin or to the rounded anal papilla. Colour in spirits, according to Herre: "old ivory, with a row of 4 inconspicuous spots along the side, and a fifth at the caudal base, each spot composed of blackish specks; blackish dots are scattered sparsely over the dorsal portion of the trunk, and a patch of similar dots is on each side of the throat; the fins are all colourless." Length 23 mm.

Habitat: Sulu Islands (Sitankai!).

Type and paratypes seen in Stanford University.

Note: This species has about 24 very deciduous, cycloid scales, as I found in examining the type and paratypes. Therefore, and in other respects, it is certainly not a *Gobiosoma*, but the genus to which it belongs is not clear to me.

Lophogobius bleekeri Popta, Zool. Meded. Leiden 6, 1921, p. 207.

Habitat: Muna (Raha).

Note: The type specimen in the Leiden Museum shows that it is not a *Lophogobius*, but a young specimen of Gobiidae. On the back there is a dermal crest-like feature as the result of deformation. The state of the specimen is pretty bad.

Chaenogobius megacephalus Fowler, Proc. Ac. Nat. Sci. Philadelphia (2) 57, 1905, p. 516.
Chaenogobius megacephalus Koumans, Zool. Meded. Leiden 22, 1940, p. 134 (examination of the type).

Habitat: Borneo!.

Type seen in the Academy of Natural Sciences, Philadelphia.

Note: This species is not a *Chaenogobius*, but an *Awaous*, of which the species could not be identified, as the scales of the type are lost for the greater part.

Kelloggella spec. Bean & Weed, Proc. U.S. Nat. Mus. 42, 1912, p. 609.
Kelloggella spec. Koumans, Zool. Meded. Leiden 22, 1940, p. 132.

Habitat: Java (Pelabuan Ratu!).

These specimens are similar to a *Kelloggella*. Except the number of finrays, D. 1 VI; D. 2 12; A. 8, they agree with *K. cardinalis* Jordan & Seale. I doubt whether the locality Java, Pelabuan Ratu, is right.

Ctenogobius bleekeri Herre, Bull. Raffles Mus. 13, 1937, p. 43.

Habitat: Singapore.

Note: We have not seen the specimens, but doubt whether the identification with *Gobius bleekeri* Day is right.

Gobius polycynodon Bleeker, Verh. Bat. Gen. 22, 1849, p. 25.

Description after Bleeker:

"Gob. corpore elongato cylindraceo, altitudine 9 p.m. in ejus longitudine; capite obtuso supra plano, 6 in longitudine corporis; fronte humili; linea rostro-frontali subrecta; latitudine capitis $1^1/_2$, altitudine 2 in ejus longitudine; oculis diametro $3^1/_2$ in capitis longitudine, postice in anteriore dimidia ejus parte sitis, diametro unico fere distantibus; dentibus maxilla inferiore serie externa caninis 8 ad 10 curvatis, maxilla inferiore setaceis confertissimis; rictu oris obliquo sub oculo desinente; squamis lateribus magnis 25 p.m. in serie longitudinali; appendice anali oblonga obtusa; pinnis, dorsali prima corpore altiore, secunda et anali obtusis, pectoralibus 6, ventralibus $6^1/_2$, caudali 5 in longitudine corporis; caudali obtusa, vix rotundata; colore corpore pinnisque viridi. B. 4. D. $6\text{-}^1/_{10}$. P. 14. V. $^1/_5$. A. $^1/_{10}$. C. 14 et later. brev." Length 39 mm.

Habitat: Java (Pasuruan!). — In estuaries.

Note: The remains of the specimen of Bleeker's collection in the Leiden Museum no. 4767, has the label *Sicyopus polycynodon*, It is impossible to decide what is meant with this species, so we gave Bleeker's description above.

Vaimosa avicennia Herre, Bull. Raffles Mus. 16, 1940, p. 17, pl. 12.

Description after Herre:

"Dorsal VI-I-7; anal I-7; there are 27 scales in a longitudinal series, plus 2 on the caudal base, and 8 from the second dorsal origin to the anal origin; predorsal scales, 6; opercular scales, 6.

This tiny goby has teeth unlike those of any other member of the genus thus far described. In addition to 2 or 3 rows of very minute teeth as usual in this genus, the lower jaw has a pair of large caniniform symphysial teeth, with enlarged bases, and a similar tooth at each outer angle of the jaw. The upper jaw has an outer row of widely spaced and very small teeth, behind which are rows of microscopic teeth.

The elongate slender body has the upper and lower profiles nearly horizontal and parallel, the depth 5.45 times in length. The broadly rounded caudal equals the head, 3.33 times in the length. The large, dorso-lateral eyes are high up, 4.5 in the head, 2.5 times in the postorbital; the broad, blunt, nearly vertical snout equals the eye; the interorbital is twice in the eye; the head is very broad, its width 1.4 times, its depth 1.8 times in the head. The first dorsal is damaged, the first spine 2.25 times in the head, the dorsals far apart; the last ray of the second dorsal is longest, extending to the caudal base, 1.28 times in the head; the penultimate anal ray is longest, 1.6 times in the head; the pectoral is 1.5 times, the broad ventrals twice in the head; the wide caudal peduncle is 1.75 times in its own length.

The color in alcohol is brownish gray, the scales everywhere except behind and under the ventrals punctulated with minute specks; there are traces of 5 dusky cross bands over the back, and down the side, where they alternate with 4 dark bars along the midline; the head is mottled with dusky, with a blackish band running diagonally from the eye across the opercle. The dorsals, anal, and caudal are black, the second dorsal with a white marginal band, the caudal with a wide white band along the top and rear, both bands with a marginal black line." Length 30 mm (standard length).

Habitat: Singapore (in a swamp near Kranji river).

Vaimosa jurongensis Herre, Bull. Raffles Mus. 16, 1940, p. 18, pl. 13.

Description after Herre:

"Dorsal VI-I-6 or 7; anal I-6; scales in longitudinal series 24 or 25 + 1 on the caudal base; predorsal scales usually 6, sometimes 7, in one specimen 5; scales in transverse series from second dorsal origin to anal origin, 7; four or five large scales on the opercle.

This is a big-headed, stoutly built fish, laterally compressed posteriorly and therefore wedge-shaped seen from above. The depth is 4 to 4.5 times, the head 2.9 to 3 times, the broadly rounded caudal 3.3 to 3.5 times in the length. The breadth of the head equals or exceeds the body depth, 1.35 to 1.4 times in the length of the head, or 4 to 4.1 times in the standard length. The eye is 5 to 5.4 times in the head and 1.3 to 1.5 times in the snout, which is 3.5 to 3.9 times in the head. The postorbital is 1.8 times, the interorbital 5.4 to 5.8 times in the head.

The body is deepest before the first dorsal, descending rapidly to the interorbital, the snout convex and broadly rounded. The mouth is large to very large; in the smallest specimens the maxillary extends to beneath the middle of the eye, and in mature ones it reaches much beyond the eye and is 1.6 to 1.7 times in the head; most of the specimens seem to be males, but the mouth extends at least to the hind margin of the eye in mature females.

The minute teeth are in 2 or 3 rows anteriorly, but reduced to a single row posteriorly. The first dorsal is low, seldom reaching the second dorsal origin when depressed, the third spine 2.2 to 2.5 in the head; the second dorsal and anal do not reach the caudal when depressed, the penultimate ray longest, 1.9 to 2 times in the head. The large, rather pointed pectoral extends to the origin of the anal or a little more, its length 3.25 to 3.5 in the standard length. The large ventrals extend beyond the vent and may reach the anal, 4 to 4.3 times in the length. The opercular scales are deeply embedded and very hard to see. The anal papilla is very small, the sexes not well differentiated as none are in breeding condition.

In life this little fish is a pinkish red, almost flesh color, with a red spot on each scale on the upper half of the body, the caudal and dorsal fins with cross rows of red spots.

In alcohol the color is pale whitish yellow, with 5 or 6 broad blackish cross bands over the back; 4 narrow dusky bars along the side, the first beneath the pectoral tip, the last on the caudal base, where it merges into a vertical black bar; beneath the pectoral is a vertical black stripe or spot; a brown or blackish bar extends from the eye diagonally backward upon the preopercle; the opercle is more or less black spotted; the first dorsal has a clear band across its middle, with a row of black spots above and below it, the lower one ending in a large black spot; the second dorsal has 3 or 4 cross rows of black spots; the caudal is cross barred by 5 or 6 rows of black spots; the other fins are clear; the eyes are green." Length 35 mm (standard length).

Habitat: Singapore Island (brook at Jurong).

Vaimosa kabilia Herre, Bull. Raffles Mus. 16, 1940, p. 19, pl. 14.

Description after Herre:

"Dorsal VI-I-7; anal I-7; scales in lateral series 27, plus 2 on caudal base; transverse series 8, predorsal 11-12; opercular scales, 8.

The type, a gravid female 36 mm. long, has the depth 4.66 times, the head 3.25, the caudal 3.6, the pectoral 4, and the ventral 6 times in the length. The eye is 4.8 times, the snout 4 times in the head. The interorbital is 1.25 times in the eye.

The body is robust, the dorsal profile nearly horizontal, the ventral profile slightly arched, the last half of the body laterally compressed; the head is broad, its width 1.37 in its own length, its depth 1.8 times. The blunt snout is convex; the wide, slightly oblique mouth reaches a vertical slightly beyond the middle of the eye; the teeth are minute, typical; the interorbital is wide and flat; the dorso-lateral eyes are in the anterior half of the head and project above the dorsal profile. There are 2 curved rows of sensory papillae across the cheek.

The fins are all short; the dorsals are far apart, the first not reaching the second by 3 scales when depressed; the second dorsal and anal when depressed are distant from the caudal; the first dorsal height is 2.75, the second dorsal and anal 2.2 times in the head; the pectoral is broad, the ventrals noticeably short, remote from the anus; the caudal is short and bluntly rounded; the least depth of the caudal peduncle is twice in its own length.

The color in alcohol is whitish, each scale except on the belly with a vertical blackish bar under its middle; above and behind the pectoral base is a diagonal black bar; a blackish brown stripe runs from the lower margin of the eye back upon the pectoral base, becoming a diffuse blotch on the opercle; two dusky stripes from the eye to the margin of the snout. The dorsals are marked by cross rows of black dots; the caudal has two large black spots on its base, and numerous cross-rows of black dots on its upper threefourths; the other fins are tinged with pale brown, the anal with a dark margin." Length 36 mm (standard length).

Habitat: British North Borneo (Kabili river).

Vaimosa oratai Herre, Bull. Raffles Mus. 16, 1940, p. 20, pl. 15.

Description after Herre:

"Dorsal VI-I-7; anal I-7; there are 23 scales in a lateral series, 7 scales from the dorsal origin to the anal origin, 6 predorsal, and 5 scales on the opercle.

The depth is 4 times, the head about 3, the caudal 3.4 to 3.6 times in the length. The eye is 3.5, the snout 4.6 to 4.9, the postorbital twice in the head; the protuberant dorso-lateral eyes are very close together, the interorbital less than a third of an eye diameter.

The body is oblong, the upper profile very gently convex, the bluntly rounded snout descending obliquely, the lips even; the mouth extends to beneath the front part of the eye in the female, to beneath the hind margin of the eye in the male. In a male specimen the first dorsal spine is excessively long and filamentous, reaching beyond the posterior end of the second dorsal base, 2.24 times in the length; in a female the first dorsal is low, the second spine longest, 2.4 times in the head, or 7.2 in the length. The second dorsal and anal are of equal height, and fall much short of the caudal when depressed, twice in the head, 6 times in the length. The pectoral is 1.7 in the head; the broad ventral reaches the anal papilla, 1.3 in the head, the least depth of the caudal peduncle is 2.14 in its own length; the anal papilla is thick and broadly rounded in the female, more pointed, much thinner and smaller in the male.

The color in alcohol is yellowish to grayish white, with 5 broad cross bands, composed of blackish brown dots, over the back, and 5 short dark bars alternating with them along the middle of the side; a dusky cross bar on the caudal base in the female, a dark brown patch enclosing a white spot on the caudal base of the male; 3 or 4 black spots on the median line under the anal and caudal peduncle; the female has a short blackish brown band from the eye down and back across the preopercle, and a blackish brown spot covering most of the opercle. The dorsal has a large black spot posteriorly and a similar cross band on the upper third; the second dorsal has a basal and a marginal blackish longitudinal band; the pectoral is clear, the other fins more or less specked." Length 18 mm (standard length).

Habitat: British North Borneo (from a brook at Tawau).

Macgregorella bravoi Herre, Philipp. Journ. Sci. 72 no. 4, 1940, p. 363 pl. 5.

Description after Herre:

"Dorsals VI, I, 9; anal I, 8; scales in longitudinal series 35, plus 1 or 2 on caudal base; transverse series 18; predorsal 6 to 10.

Depth 5.4 to 5.6, head 3, caudal 3.3 to 3.5, pectoral 3.75 to 4 times in length. Width of head 1.3 times, depth twice in own length. Eyes small, laterodorsal, 7 times, snout 4 times in head.

Dorsal and ventral profiles nearly horizontal and parallel, breadth of trunk 1.9 times in width of head. Mouth wide, short, oblique, not extending more than half way to a vertical from eye; teeth very small, in 4 rows, those of outer row in lower jaw enlarged and curved backward. Vertical fins all low; first dorsal reaching second dorsal origin when depressed, 2.8 to 3.3 in head; second dorsal and anal scarcely reaching broadly rounded caudal when depressed, 2.3 to 2.5 times in head; pectoral about 1.25 times in head; short broad ventrals completely united as in all members of the genus, 1.8 times in head. Least depth of caudal peduncle 1.3 times in own length in type.

On margin of snout a row of short, erect, fringed barbels, a second row before eyes; a row of 6 short barbels running back on each side from chin; another row of small barbels running back from angle of mouth; behind eyes a crossrow of 5 sensory papillae; on cheek 3 longitudinal rows of papillae and 3 short vertical rows on opercle; another row passing along outside of eye and running back to nape, which may have several other very short rows.

In alcohol very pale tan, with 5 brown crossbars; first crossbar on top of head, second over pectoral base, third under first dorsal, fourth and fifth under second dorsal; a broad brown band extending from upper angle of pectoral to caudal base; a large brown bar or blotch across pectoral base; a brown bar or rows of brown spots on first dorsal; second dorsal and caudal crossbarred by rows of brown spots; caudal base also with a large dark-brown spot above and below; other fins colorless." Length 32 mm (standard length).

Habitat: Waigeu. — Philippines (Luzon).

Note: According to Herre, "This very distinct species is merely an extreme type of *Macgregorella,* having few or no ridges on the head, but instead, short barbels and papillae. However, its general appearance denotes close relationship to the other species of *Macgregorella*. The typical goby ventrals separate it from *Callogobius,* which it otherwise resembles in various respects."

Rhinogobius suluensis Herre, Monogr. 23 Bur. Sci. Manila 1927, p. 193, pl. 14 fig. 3.

Herre described this species after 6 specimens from Bungau, Sulu Province. Of these specimens one probably belongs to Apocrypteinae, 4 specimens probably are young *Oligolepis acutipennis* (C.V.),1 specimen is *Ctenogobius grammatogaster* Blkr. See Koumans, Zool. Meded. Leiden 22, 1940, p. 187.

Gobioides tenuis (C.V.)? Hardenberg, Treubia 13, 1931, p. 145.

Habitat: Sumatra (Bagan Si Api Api).

Note: It is not possible to determine which species of *Taenioides* it may be.

Trypauchen vagina (?) Bl. et. Schn. Volz, Zool. Jahrb. Abt. Syst. 19 Heft 4, 1903, p. 367.

Habitat: Sumatra (Banju asin!).

Note: The specimen of $5^1/_2$ cm in the collection of the Bern Museum no. 106, either belongs to *Ctenotrypauchen* or *Trypauchenichthys,* as the ventral fin is probably emarginate. The specimen, however, is in a bad state.

Eleotris compressa Krefft is stated by Regan, Ann. Mag. Nat. Hist. (8) 1, 1908, p. 153 from Ajacombo (New Guinea), but without further indication. We have not seen the specimen and doubt whether it is well identified. The species is known from waters of eastern Australia from Cape York to Jervis Bay, headwaters of the Condamine river in Queensland, Port Darwin. The name of the genus to which this species belongs is *Hypseleotris.* For synonyms and localities see McCulloch & Ogilby, Rec. Austral. Mus. 12, 1919, p. 285.

Eleotris squamifrons Perugia, Ann. Mus. Civ. Genova 33, (2a Ser. 13) 1893, p. 254.

Description according to Perugia:

D. $6^1/_8$ A. $^1/_8$ L.l. 25 L.t. 7 Kifa-juc. (Engano).

La lunghezza del capo è poco meno del terzo della lunghezza totale ed il doppio dell' altezza del corpo. Il capo è depresso a muso allungato, con la mascella inferiore più lunga. Non si trovano spine al preopercolo. I denti minuti a fascie. Il diametro dell' occhio è il sesto della lunghezza del capo ed uguale allo spazio interorbitale. Una stretta striscia di minute squame si estende sui frontali ma non arriva alla punta del muso. Il profilo del capo sale gradatamente fino all' origine della prima dorsale, chè è il punto più alto del corpo, per scendere poi dolcemente fino alla base della caudale. La prima dorsale è alta $^2/_3$ circa quanto il corpo ed ha raggi sottili flessibili: la seconda dorsale è alta un po' più del corpo essendo uguale in altezza all' anale. Tra l'origine della seconda dorsale e l'anale si contano 8 serie di squame. Le pettorali sono lunghe $^2/_3$ del capo, la loro estremità arriva alla decima squama della linea laterale. Le ventrali sono piccole essendo la metà delle pettorali. Il colore del corpo è giallo aranciato, largamente marmorato di bruno rossastro. Tutte le pinne nere."

Of this species the status is not clear to us.

Eleotris hilgendorfi Pietschmann, Jahrb. Nass. Ver. Naturk. Wiesbaden 66, 1913, p. 182, a new name for *E. maltzani* Hilgendorf, Sitz. ber. Naturf. Fr. Berlin 1889, p. 53, which is preoccupied. The specimen of Hilgendorf did not come from Borneo, as stated by Pietschmann, but from Haiti.

PROBABLE HYBRIDS OF GOBIOIDEA

In the last years some probable hybrids between species of Gobioidea have been published. Koumans, Zool. Meded. Leiden 22, 1940, p. 180, drew attention to some specimens, which he regards to be hybrids: "Here I note 2 specimens of 20 and 25 mm from the fishponds near Pasar Ikan, Batavia, July 18, 1938, which agree for the greater part with *Stigmatogobius javanicus* (Blkr.), having the long pointed caudal fin of *Acentrogobius globiceps* (Hora), instead of the short broadly rounded fin of *S. javanicus*. The pattern of melanophores is intermediate between the two species, showing, e.g., one blotch before the caudal fin instead of two. In the mangrove swamps near Antjol, July 15, 1938 I found 1 specimen of *Acentrogobius globiceps*. One specimen of 15 mm shows D. 2 I. 8; A. I. 8. It has the shape of mouth and teeth of *S. javanicus*. The pattern of melanophores is intermediate between *A.*

globiceps and *S. javanicus*. Caudal fin longer than in *javanicus*. It may be possible that the two species breed together."

In the unpublished manuscript of: "The Pisces and Leptocardii of the Snellius Expedition", (in manuscript), Koumans describes another probable hybrid from Stat. 40, 1° 21'.5 S, 119° 11'.5 E; plankton net 3, 0-1 m; Aug. 8, 1929, 1 specimen of 7 mm. "This specimen I regard to be a hybrid between an *Oxyurichthys* (e.g. *microlepis*) and another genus of Gobiinae (e.g. *Acentrogobius*). From the specimen I made a description as follows:

D. 1 VI; D. 2 I. 11; A. I. 10; L.l. ± 42; L.tr. 14; Predorsal scales 18.

Height of body $5^1/_2$ in length, $7^1/_4$ in total length. Head feebly compressed, obtuse, 4 in length, $5^1/_4$ in total length. Eye 4 in head, interorbital $^1/_2$ eyediameter. Snout obtuse, as long as eye; tip below inferior margin of eye. Anterior nostril tubulate. Mouth a little oblique, lower jaw prominent. Maxillary extends to middle of eye. Teeth in upper jaw: outer row distant, behind this some rows of very small teeth. In lower jaw teeth in some rows, outer row and in front inner row enlarged; laterally on each side a canine in outer row. Tongue rounded. From posterior nostril a vertical mucous canal to edge of mouth, from here 2 longitudinal canals over cheek. Interorbital in median line with 2 pores; 1 pore behind eye, some along posterior margin of preopercle. Gillopenings not continued forward below. No fleshy flaps on inner edge of shouldergirdle. Head scaled above from a little behind the eye, median line of nape scaled. Scales of body ctenoid posteriorly, cycloid anteriorly. D. 1 about as high as body, 1st ray is the longest. D. 2 and A. lower than body. P. pointed, as long as head. V. a little shorter. C. oblong, a little longer than head. Colour yellowish. Head with indistinct dark blotch behind eye. On back each scale with a dark margin. On the sides a row of about 7 dark blotches, those on caudal peduncle close together. Along bases of D. 1 and D. 2 on body a row of dark spots, continued on upper part of caudal fin. Base of D. 2 with 2 rows of dark spots. Base of D. 1 dark. Outer margin of A. dark. V. in median part dark. Besides the described dark spots on C. a few spots on lower half near the base."

In the collection of the Amsterdam Museum we found another probable hybrid, which shows the characters as follows:

D. 1 VI; D. 2 I. 7; A. I. 7; P. 12?; L.l. 30; L.tr. 9; Predorsal scales 8.

Body elongate, compressed, height 5 in length. Head subcylindrical, obtuse, 4 in length. Eye $3^1/_2$ in head, interorbital 1 eyediameter. Snout blunt, as long as eye, tip below eye. Anterior nostril in a rim. Upper jaw prominent, protruding. Mouth nearly inferior, shaped as in *Mugil*. Teeth in upper jaw in one row, equal, obliquely notched (as in *Sicyopterus)*. In lower jaw some rows of erect simple teeth. Labial teeth in lower lip may be present. Maxillary extends to below anterior margin of eye. Gillopenings not continued forward below, isthmus moderate. Below eye 2 longitudinal mucous canals, 1 row along lower margin of preopercle. Head scaled above behind the eyes, foremost scale in median line enlarged (as in *Stigmatogobius*), cheek and opercle scaled. Scales of head and breast cycloid, of body ctenoid. First dorsal fin lower than the second, middle rays are the longest. Caudal fin rounded. Pectoral fin as long as head without snout. Ventral fin as in Gobius, basal membrane scaled! Colour brownish gray. Base of first dorsal fin with dark spots, a crescent shaped dark band halfway, which forms a large blotch at the posterior end of the fin; above this band a white band, tip dark. Rays of second dorsal and caudal fin spotted. Anal and ventral fin with minute spots. Length 50 mm.

Habitat: East Borneo, coastal mangrove.

Note: This peculiar specimen seems to us to be a hybrid between a *Sicyopterus*-like Goby and a *Stigmatogobius*-like Goby. It is different from the Sicydiaphiinae, which we know in having the cheek and opercle scaled.

ALPHABETIC INDEX

OF

VERNACULAR NAMES[1]

Agori 168
Babalak 310
Bakut 298, 345
Balang 345
Båså 114, 168
Batutuk 355
Bedul 44, 63
Belontok 126
Belosso 44, 46, 49, 168
Belunguran 36
Belunguran itam 356
Belunguran majang 168
Betutu 355
Bilir 180
Blodo 214
Blodo tjina 260
Blodok 89, 91, 152, 217, 219, 260
Blonguran 168
Bloso 120, 168
Bloso-watu 307
Bluso 168
Bobossok 63, 168
Bogo tjina 195
Bontini 168
Bonto 168
Bosok 152
Bossok 63, 168
Buccat buttá 324
Bungi 168
Bungkus 227
Bungu 159
Djadjan aprit 278
Djambudur 168
Duwang 339
Gabus 348
Gabus lawut 217, 345
Gabus tomang 117
Gaful 298
Gĕdangan 114
Glodog 260
Glodok tutul 214
Gobo 195
Impun 225
Kadangan 152
Kajo 359
Kakatjangan 195
Ka-temum 168
Katjang katjang 195
Kawatu 378
Kebus 339
Kemboku 296
Kodjol 168
Kondang kendas 195
Koto tjino 286
Lamutjong 168
Larodon 168
Latåré 311
Layar 260
Lebă's lebå's 345
Lebot 348
Lĕntir 112
L'm subul 309
Lundjat 260
Mangena 164

---

1) As in Java the three languages: javanese, sundanese and malay are spoken, we have accordingly placed behind the indigenous names (Malay.), (Sundan.) or (Javan.). In naming a fish the malay people use as a rule "ikan" = fish before the special name. In most cases we have omitted "ikan".

Mènga 227
Mile mile 36
Mollon 164
Mukus 227
Nékat 225
Nike 339
Niki 339
Njåhå 124
Njanjan 249, 252
Njårå 236
Njerreh 168, 296
Njòhò 180
Olol 90
Piniponro 156
Puntang 44, 46, 55, 57, 59, 65, 94, 194, 255, 306, 310, 345, 379
Pusok 152
Salusur 378
Seh telat 212
Seh tilat 214
Sengilu 348
Sèrèg 224
Seti 154
Takawatu 378
Tambalusu 168
Tambujon 113
Tangion 382
Tawor 152
Tempakul 217, 219, 260
Tenggeleng batu 73
Tenggeleng 65
Tenguling 63
Tjentjen tengeh 255
Tonguloba 168
Tungulian 311
Tunguling 63
Utjang 227
Wahat 233

ALPHABETIC INDEX

OF

GENERA AND SPECIES

abax, Asterropteryx 319
abax, subsp. of Eviota abax 319
abbotti, Taenioides 275, 276
Aboma aliciae 77, 78
Aboma graeffei 188
acanthistius, Hoplopomus 29, 30
Acanthogobius ommaturus 27
acanthopomus, Culius 297
acanthopomus, Eleotris 297
Acentrogobius 15, 18, 19, 29, 52, 53, 76, 79, 379, 383, 393
Acentrogobius acutipinnis 93
Acentrogobius balteata 54, 73
Acentrogobius bontii 53, 54, 56
Acentrogobius caninus 29, 53, 61, 62
Acentrogobius cauerensis 54, 68, 69, 172
Acentrogobius chlorostigma 56
Acentrogobius chlorostigmatoides 53, 58
Acentrogobius cyanomos 53, 64
Acentrogobius decoratus 54, 74
Acentrogobius elberti 53, 55
Acentrogobius globiceps 54, 75, 76, 124, 392, 393
Acentrogobius goldmanni 54, 70
Acentrogobius hendersoni 54, 68
Acentrogobius herrei 53, 61
Acentrogobius janthinopterus 53, 59, 60
Acentrogobius leptochilus 54, 76
Acentrogobius oligactis 53, 63
Acentrogobius ornatus 29, 54, 71, 72
Acentrogobius puntang 54, 66
Acentrogobius reichei 54, 77, 177, 380
Acentrogobius spilopterus 64, 65
Acentrogobius viridipunctatus 53, 56
Actinogobius 14, 27
Actinogobius ommaturus 27
acutipennis, Gobius 41, 44, 92, 93
acutipennis, Oligolepis 92, 93, 391
acutipinnis, Acentrogobius 93
acutipinnis, Aparrius 93, 94
acutipinnis, Ctenogobius 93
acutipinnis, Gobius 92, 93
acutipinnis, Oligolepis 93
acutipinnis, Stenogobius 93
adspersus, subsp. of Mogurnda mogurnda 374, 376
aeolosoma, Gobius 188, 190
aeolosoma, Mapo 189
africana, var. of Gobius caninus 179
aggregatus, Brachygobius 193, 196
agilis, Hypseleotris 347
agilis, Ophieleotris 347
aglestes, Glossogobius 163, 164, 165
Agonostoma darwiniense 343, 346
albilosus, Asterropteryx 290, 291
albimaculatus, Amblygobius 136, 141, 142
albimaculatus, Gobius 141
albomaculatus, Amblygobius 143
albomaculatus, Gobius 141
albopunctatus, Gobius 187, 188, 190
albostriatus, subsp. of Periophthalmus koelreuteri 208, 209
alcocki, Ctenogobius 194
alcockii, Gobius 194, 195
aliciae, Aboma 77, 78
Allogobius 316
Allogobius viridis 317
amabilis, Oxyurichthys 48, 49
amadi, Gobius 172
amadi, Weberogobius 172, 173
amboinensis, Butis 306, 308
Amblyeleotris 283, 341
Amblyeleotris periophthalmus 341

Amblygobius 16, 17, 135, 137
Amblygobius albimaculatus 136, 141, 142
Amblygobius albomaculatus 143
Amblygobius bynoensis 136, 139, 140
Amblygobius decussatus 136, 137
Amblygobius inornatus 136, 137
Amblygobius insignis 197, 199
Amblygobius linki 136, 139
Amblygobius naraharae 130, 131
Amblygobius papilio 143
Amblygobius papuanus 87
Amblygobius perpusillus 137
Amblygobius perpusillus buanensis 137, 138
Amblygobius phalaena 141, 142, 143
Amblygobius semicinctus 141, 143
Amblygobius semicinctus semicinctus 142
Amblygobius sphynx 136, 143
amblyopinus, Orthostomus 370, 371
Amblyopus 269
Amblyopus brachygaster 270, 271
Amblyopus brachysoma 266
Amblyopus buchanani 272
Amblyopus caeculus 273, 274
Amblyopus cirratus 270
Amblyopus eruptionis 272
Amblyopus gracilis 270, 271
Amblyopus hermannianus 273, 274, 275
Amblyopus mayenna 275
Amblyopus rubicundus 275
Amblyopus sumatranus 271
Amblyopus taenia 275, 276
Amblyopus urolepis 268, 269
amblyrhynchus, Stigmatogobius 76, 110, 121
amboinensis, Butis 305, 308
amboinensis, Eleotris 306, 308
amiciensis, Gobius 3, 4, 5
Amoya 176
andamanensis, Gobius 66
andrei, Gobius 188
anguillaris, Gobioides 273, 274
anguillaris, Gobius 273
anguillaris, Taenioides 270
anguilliformis, Gobioides 273
angustiformis, subsp. of Periophthalmus dipus 211; 212, 213
anjerensis, Gnatholepis 169, 171
anjerensis, Gobius 171
annulatus, Gobius 141, 142
anotus, Taenioides 268
Aparrius 92
Aparrius acutipinnis 93, 94
Aparrius moloanus 54, 55
Apocryptes 39
Apocryptes bivittatus 140, 141
Apocryptes bleekeri 254
Apocryptes borneensis 247, 248
Apocryptes brachypterus 242, 243
Apocryptes cantonensis 204, 205
Apocryptes cantoris 252
Apocryptes changua 248, 249
Apocryptes chinensis 261
Apocryptes dentatus 249
Apocryptes fasciatus 141, 142
Apocryptes glyphidodon 254
Apocryptes glyphisodon 254
Apocryptes henlei 251
Apocryptes lanceolatus 249
Apocryptes lineatus 139, 140, 141
Apocryptes macrolepis 251
Apocryptes macrophthalmus 263
Apocryptes madurensis 254
Apocryptes pectinirostris 261
Apocryptes variegatus 244
Apocryptichthys 247, 252
Apocryptichthys cantoris 252, 253
Apocryptodon 247, 253, 254
Apocryptodon bleekeri 255, 256
Apocryptodon edwardi 249
Apocryptodon fasciatus 141, 142
Apocryptodon glyphisodon 255, 256
Apocryptodon madurensis 254, 255, 256
Apocryptodon malcolmi 255, 256
Apocryptodon montalbani 254, 255, 256
Apocryptodon punctatus 255
Apocryptodon sealei 254, 255, 256
Apocryptodon taylori 255, 256
Apocryptodon wirzi 254, 256
apogonius, Gobius 111, 112
aporocephalus, Eleotris 347
aporos, Eleotris 346, 349
aporos, Ophieleotris 347
aporos, Ophiocara 343, 346, 347
aporos, var. of Ophiocara aporos 349
aporus, Eleotris 346
aporus, Ophiocara 346, 347
argentilineatus, Periophthalmus 201, 210, 211, 214

argentilineatus, subsp. of Periophthalmus argentilineatus 215
argentilineatus, var. of Periophthalmus koelreuteri 211
argentiventralis, subsp. of Periophthalmodon schlosseri 217
aruensis, Bostrichthys 286, 288
aruensis, Bostrychus 288
aruensis, Eleotris 359, 361
aruensis, Oxyeleotris 359
aruensis, Valenciennea 338, 339
aspro, Platyptera 376, 378
aspro, Rhiacichthys 376, 377
aspro, Rhyacichthys 376, 377
Asterropterix 289
Asterropterix semipunctatus 290
Asterropteryx 32, 283, 289, 290, 324
Asterropteryx abax 319
Asterropteryx albilosus 290, 291
Asterropteryx ensifer 291
Asterropteryx ensiferus 290, 291
Asterropteryx güntheri 316
Asterropteryx leuciscus 325
Asterropteryx modestus 328
Asterropteryx semipunctatus 289, 290, 291
Asterropteryx taenionotopterus 327
atrangulatus, Gobiodon 8, 9
atribranchiostegus, Rhinogobius 77, 79
atripinnatus, Rhinogobius 58, 59
atripinnis, Gobius 189, 190
auchenolepis, Oxyurichthys 40, 49, 50
aucupatorius, Boleophthalmus 263, 265
Aulopareia 52
aurifodinae, Mogurnda 374
australis, Periophthalmus 216
australis, subsp. of Periophthalmus schlosseri 217, 218
Austrogobio 324
avicennia, Vaimosa 386
Awaous 18, 150, 151, 154, 385
Awaous genivittatus 35
Awaous grammepomus 151, 152
Awaous macropterus 151
Awaous melanocephalus 152
Awaous ocellaris 152, 153
Awaous puntangoides 66
Awaous stamineus 151, 153, 170
badia, Macgregorella 98, 100
balia, Eleotris 299
balinense, Sicydium 240
balinense, Sicyopus 220, 239
baliuroides, Ctenogobius 77, 380
baliuroides, Gobius 235, 379, 380
baliuroides, Rhinogobius 77, 179, 380
baliurus, Gnatholepis 169
baliurus, Gobius 154, 169, 170
baliurus, Isthmogobius 170
balteata, Acentrogobius 54, 73
balteata, Vaimosa 73
barbarus, Periophthalmodon 216
Bathygobius 18, 183, 184
Bathygobius blancoi 189
Bathygobius bravoi 189, 191
Bathygobius fuscus 184, 187, 188, 189
Bathygobius laoe 189
Bathygobius mearnsi 189
Bathygobius nox 189
Bathygobius petrophilus 184
Bathygobius scapulopunctatus 184, 186
Batracheleotris 96
Batracheleotris sclateri 102
beauforti, Chonophorus 36
beauforti, Gobius 35, 37
beccarii, Gobius 381
belobrancha, Belobranchus 361, 362
belobrancha, Eleotris 362, 363
Belobranchus 283, 358, 361
Belobranchus belobrancha 361, 362
Belobranchus quoyi 362
Belobranchus taeniopterus 362
belosso, Gobius 46, 49
belosso, Oxyurichthys 46
bernadoui, Coryphopterus 61, 62, 63
Biat 79
Biat luzonica (-us) 89, 90, 91
bicirrhosus, Gobius 128, 129
bicirrhosus (-a), Illana 128
bikolana, Vaimosa 105, 106
bikolanus, Pseudogobius 105
bilobatus, Cottogobius 175
biocellatus, Glossogobius 163, 164
biocellatus, Gobius 163
birtwistlei, Gobiella 244
bitelatus, Gobius 29, 30
bivittatus, Apocryptes 140, 141
blancoi, Bathygobius 189
bleekeri, Apocryptes 254
bleekeri, Apocryptodon 255, 256
bleekeri, Ctenogobius 385
bleekeri, Gobius 385
bleekeri, Hemigobius 191

bleekeri, Lophogobius 384
blokzeyli, Gobius 35, 37
boddaerti, Boleophthalmus 259, 261
boddarti, Boleophthalmus 258, 259
boddarti, Eleotris 259
boddarti, Gobius 259
boddarti, Oxyeleotris 357
boldinghi, Pleurosicya 237
Boleophthalmus 257, 258
Boleophthalmus aucupatorius 263, 265
Boleophthalmus boddaerti 259, 261
Boleophthalmus boddarti 258, 259
Boleophthalmus caeruleomaculatus 261, 262
Boleophthalmus chinensis 261, 263
Boleophthalmus histophorus 263
Boleophthalmus novaeguineae 264
Boleophthalmus pectinirostris 258, 261
Boleophthalmus plinianus 259
Boleophthalmus sculptus 258, 259
Boleophthalmus sinicus 263
Boleophthalmus smithi 249
Boleophthalmus taylori 249, 250
Boleophthalmus viridis 263, 264
Boleops 262
bontii, Acentrogobius 53, 54, 55, 56,
boreus, Zonogobius 149, 150
borneensis, Apocryptes 247, 248
borneensis, Gobius 127
borneensis, Parioglossus 363, 364
borneensis, subsp. of Periophthalmodon tredecemradiatus 219
borneensis, Periophthalmus 218, 219
borneensis, Pseudapocryptes 247, 248
borneensis, Stigmatogobius 110, 127
Boroda 352
Boroda malua 358, 359
Borodoamirus 352
boscii, Gobius 166, 168
Bostrichthys 283, 285
Bostrichthys aruensis 286, 288
Bostrichthys sinensis 285, 286
Bostrichthys strigogenys 285, 287
Bostrichthys zonatus 286, 288
Bostrictis 285
Bostrychichthys 285
Bostrychus 285
Bostrychus aruensis 288
Bostrychus strigogenys 287
Bostrychus sinensis 286
Bostrychus zonatus 288
boulengeri, Cingulogobius 130
boulengeri, Pleurogobius 130
Brachyamblyopus 265, 266
Brachyamblyopus brachysoma 266
Brachyamblyopus coecus 266, 268
Brachyamblyopus intermedius 266, 269
Brachyamblyopus multiradiatus 266, 267
Brachyamblyopus olivaceus 268, 269
Brachyamblyopus urolepis 266, 267, 268
Brachyeleotris 289
Brachyeleotris cyanostigma 290
Brachyeleotris ensifera 291
brachygaster, Amblyopus 270, 271
Brachygobius 18, 192, 193, 196
Brachygobius aggregatus 193, 196
Brachygobius doriae 194, 196
Brachygobius nunus 192, 193, 194, 197
Brachygobius sua 194
Brachygobius xanthomelas 194, 195
Brachygobius xanthozona 193, 194
brachypterus, Apocryptes 242, 243
brachypterus, Gobiopterus 242, 243
brachysoma, Amblyopus 266
brachysoma, Brachyamblyopus 266
brachyurus, Eleotris 294
bravoi, Bathygobius 189, 191
bravoi, Macgregorella 390
breviceps, Gobius 187
brevifilis, Gobius 178, 179, 180
brevis, Sicyopterus 222, 233
brocki, Vaimosa 113, 115
brunneus, subsp. of Glossogobius giuris 166
brunneus, Gobius 165, 187
bruynisi, Schismatogobius 20, 21
Bryanina 220
Bryanina inana 224, 225
buanensis, subsp. of Amblygobius perpusillus 137, 138
buccatus, Gobius 188
buchanani, Amblyopsus 272
buchanani, Gobioides 272
buchanani, Taenioides 270, 272
Bunaka 283, 349, 350
Bunaka gyrinoides 350
Bunaka herwerdenii 350, 351
Bunaka pinguis 350, 351
Bunaka sticta 350
Butis 283, 304
Butis amboinensis 305, 306, 308
Butis butis 304, 305, 306, 308, 309, 310

butis, Butis 304, 305, 306, 308, 309, 310
butis, Cheilodipterus 306
butis, Eleotris 305, 308, 309, 310
Butis gymnopomus 305, 311
Butis koilomatodon 313
Butis leucurus 308, 309
Butis melanopterus 306
Butis melanostigma 305, 309, 310
Butis prismaticus 304, 305
Butis serrifrons 313
bynoensis, Amblygobius 136, 139, 140
bynoensis, Gobius 139, 140
cacabet, Illana 128, 129
caeculus, Amblyopus 273, 274
caeculus, Gobioides 273
caeculus, Taenioides 271, 273
caeruleomaculatus, Boleophthalmus 261, 262
caeruleo-maculatus, Mars 21, 22
caeruleo-punctatus, Mars 21
cagayanensis, Vaimosa 156
calderae, Gobius 72, 73
calderae, Rhinogobius 72
caledonicus, Eleotris 338, 339
caledonicus, Gobius 188, 190
Calleleotris 333
Calleleotris longipinnis 336
Calleleotris muralis 338
Calleleotris strigata 334
Calleleotris taeniura 336
Callieleotris 352
Callieleotris platycephalus 354, 355
calliurus, Gnatholepis 169, 170, 171
Callogobius 16, 17, 96, 391
Callogobius centrolepis 97, 100, 101
Callogobius hasseltii 96, 98, 99
Callogobius hasseltii var. mucosus 98
Callogobius liolepis 96, 97, 98
Callogobius mucosus 98
Callogobius sclateri 97, 100, 102
Callogobius snelliusi 97, 102
campbellianus, Glossogobius 116, 117
canalae, Gnatholepis 66
canalae, Gobius 66, 67
canarensis, Eleotris 350, 351
canina, Eleotris 331
canina, Odonteleotris 330, 331
caninoides, Gobius 31
caninoides, Hoplopomus 29, 31
caninoides, Oplopomus 29, 31, 32
caninus, Acentrogobius 29, 53, 61, 62
caninus, Gobius 61, 62, 63, 77
caninus magnisquamatus, Rhinogobius 62
caninus, Rhinogobius 62
cantherinus, Eleotris 299
cantonensis, Apocryptes 204, 205
cantonensis, Parapocryptes 251
cantonensis, Periophthalmus 204
cantonensis, subsp. of Periophthalmus cantonensis 204
cantoris, Apocryptes 252
cantoris, Apocryptichthys 252, 253
cantoris, Eleotris 343, 346
caperatus (-a), Eleotris 313, 314
capistratus, Gnatholepis 69
capistratus, Gobius 68, 69
Caragobius 266
Caragobius geomys 268
Carassiops 324
Carassiops cyprinoides var. güntheri 326
cardinalis, Kelloggella 385
carolinensis, Gobius 187
catebus, Gobius 165
catulus, Evorthodus 188
catulus, Gobius 187
cauerensis, Acentrogobius 54, 68, 69, 172
cauerensis, Gobius 68, 69
Caulichthys 324
cavifrons, Eleotris 294, 295, 297
cavifrons, Gobius 157
cavifrons, Tamanka 155, 156, 157
Cayennia 274
cebuanus, Cryptocentrus 83, 84
celebius, Glossogobius 166, 167
celebius, Gobius 165, 166, 168
Centrogobius 28
Centrogobius notacanthus 29
centrolepis, Callogobius 97, 100, 101
Cephalogobius 161
Cepola coecula 273
ceramensis, Gobiodon 10
ceramensis, Gobius 10
ceylonensis, subsp. of Periophthalmus vulgaris 211, 212
Chaenogobius 385
Chaenogobius megacephalus 384
Chaeturichthys polynema 37
changua, Apocryptes 248, 249
changua, Gobius 248
Cheilodipterus butis 306

Cheilodipterus culius 294
cheni, Cryptocentrus 87, 88
chilkensis, Ctenogobius 123
chilkensis, Gobius 122
chinensis, Apocryptes 261
chinensis, Boleophthalmus 261, 263
Chlamydes 183
Chlamydes cotticeps 185
Chlamydes laticeps 185
Chlamydes leytensis 185
chlorostigma, Acentrogobius 56
chlorostigma, Gobius 56
chlorostigmatoides, Acentrogobius 53, 58
chlorostigmatoides, Gobius 58
Chonophorus 150
Chonophorus beauforti 36
Chonophorus genivittatus 35, 36
Chonophorus guamensis 152
Chonophorus lachrymosus 35, 36
Chonophorus melanocephalus 152, 153
Chonophorus ocellaris 152
chrysargus, Gobius 88
chrysosoma, Cyprinogobius 105
chrysosoma, Lophogobius 105, 106
chrysosoma, Redigobius 77, 104, 105
chrysospilos, Periophthalmus 200, 201, 202, 203, 218
chulae, Vaimosa 125
chuno, Gobiopterus 242, 243, 244
chuno, Gobius 244
cinctus, Gobiomorphus 130
cinctus, Smilogobius 23, 25, 26
cingulatus, Cryptocentrus 88
Cingulogobius 129
Cingulogobius boulengeri 130
Cingulogobius naraharae 130
circumspectus, Glossogobius 166, 167
circumspectus, Gobius 166, 168
circumspectus, Rhinogobius 166
cirratus, Amblyopus 270
cirratus, Gobioides 271
cirratus, Taenioides 270, 271, 272
cirratus, subsp. of Taenioides gracilis 271
citrinus, Gobiodon 7, 8, 11
citrinus, Gobius 11
citrinus, Pseudogobiodon 11
Cobitus pacifica 294
cocosensis, Gobius 187, 190
coelidotus, Gobius 98, 100
coecula, Cepola 273
coecus, Brachyamblyopus 266, 268
coecus, Taenioides 268
compressa, Eleotris 391
concavifrons, Glossogobius 166, 167
concavifrons, Gobius 166, 168
concolor, Gobius 66, 67
corallinus, Rhinogobius 188, 189, 190
corletti, Gnatholepis 69, 70
cornutus, Oxyurichthys 45, 46
Coryphopterus bernadoui 61, 62, 63
cotticeps, Chlamydes 185
cotticeps, Gobius 185
Cottogobius 18, 174
Cottogobius bilobatus 175
Cotylopus 220
crassiceps, Mapo 188, 189, 190
crassus, Sicyopterus 226, 227, 228
Creisson 52
Creisson validus 59, 60
crescens, Eleotris 358, 359
criniger, Ctenogobius 177, 178, 179, 380
criniger, Gobius 178, 179, 180, 187
criniger, Rhinogobius 179, 180
criniger, Yongeichthys 179
Cristatogobius 15, 94
Cristatogobius lophius 95
cristatus, Euctenogobius 43, 45
cristatus, Gobius 43, 44
cristatus, Oxyurichthus 43
Crossogobius 96
Cryptocentroides 19, 23, 197
Cryptocentroides dentatus 197
Cryptocentroides insignis 197, 198
Cryptocentrus 15, 79, 80
Cryptocentrus cebuanus 83, 84
Cryptocentrus cheni 87, 88
Cryptocentrus cingulatus 88
Cryptocentrus cyanotaenia 80, 82
Cryptocentrus diproctotaenia 80, 81
Cryptocentrus filifer 79, 80, 86
Cryptocentrus fontanesii 81, 89, 90
Cryptocentrus geniornatus 85, 86
Cryptocentrus gymnocephalus 81, 91
Cryptocentrus knutteli 86
Cryptocentrus leonis 81
Cryptocentrus leptocephalus 80, 85, 86
Cryptocentrus liolepis 80, 82
Cryptocentrus niveatus 80, 84
Cryptocentrus papuanus 80, 87
Cryptocentrus papuensis 87

Cryptocentrus pavoninoides 80, 83, 84
Cryptocentrus rubropunctatus 85, 86
Cryptocentrus russus 81, 88
Cryptocentrus stigmatophorus 197
Cryptocentrus venustus 83, 84
Cryptocentrus voighti 88
Ctenogobius 18, 19, 176, 177, 379
Ctenogobius acutipinnis 93
Ctenogobius alcocki 194
Ctenogobius baliuroides 77, 380
Ctenogobius bleekeri 385
Ctenogobius chilkensis 123
Ctenogobius criniger 177, 178, 179, 380
Ctenogobius cylindricus 177, 182, 183
Ctenogobius decoratus 74
Ctenogobius dentifer 64, 65
Ctenogobius globiceps 75
Ctenogobius gracilis 177, 178
Ctenogobius grammatogaster 177, 180, 391
Ctenogobius kranjiensis 75
Ctenogobius malekulae 145
Ctenogobius meggitti 189
Ctenogobius neophytus 146
Ctenogobius notophthalmus 177, 181, 182
Ctenogobius nunus 194
Ctenogobius opalescens 183
Ctenogobius reichei 77
Ctenogobius scapulopunctatus 186
Ctenogobius triangularis 54
Ctenogobius waigiensis 54, 55
Ctenotrypauchen 276, 281, 391
Ctenotrypauchen microcephalus 278, 282
Culius 292
Culius acanthopomus 297
culius, Cheilodipterus 294
Culius fuscus 294, 295
Culius insulindicus 300
Culius macrocephalus 297
Culius macrolepis 301
Culius melanosoma 297, 298
Culius niger 294
Culius oxycephalus 299
Culius pseudacanthopomus 294
cyanoclavis, Gobius 64, 65
cyanomos, Acentrogobius 53, 64
cyanomos, Gobius 64
cyanosmos, Gobius 64
cyanostigma, Brachyeleotris 290
cyanostigma, Eleotriodes 290, 291
cyanostigma, Eleotris 290
cyanotaenia, Cryptocentrus 80, 82
cyanotaenia, Gobius 82, 88
cyclopterus, Gobius 187, 189, 190
cylindricus, Ctenogobius 177, 182, 183
cynocephalum, Sicydium 226, 228
cynocephalus, Sicyopterus 221, 226, 232
Cyprinogobius 103
Cyprinogobius chrysosoma 105
Cyprinogobius dispar 104
cyprinoides, Eleotris 326, 327, 328, 329
cyprinoides, Hypseleotris 325, 328
dalyensis, Eleotris 351
darnleyensis, Gobius 188, 189, 190
darwiniense, Agonostoma 343, 346
darwiniense (-is), Ophiocara 344
darwiniense, var. of Ophiocara porocephala 346, 349
darwiniensis, Meuschenula 344
dasyrhynchus, Eleotris 314
dasyrhynchus, Prionobutis 313, 314
davaoensis, Gnatholepis 69
decoratus, Acentrogobius 54, 74
decoratus, Ctenogobius 74
decoratus, Rhinogobius 74
decussatus, Amblygobius 136, 137
decussatus, Gobius 137, 138
deilus, Gobius 143, 144
deltoides, Gnatholepis 69
deltoides, Gobius 69, 70
dentatus, Apocryptes 249
dentatus, Cryptocentroides 197
dentifer, Ctenogobius 64, 65
depressus, Gobius 98, 100
diproctotaenia, Cryptocentrus 80, 81
dipus, Periophthalmus 201, 212, 213
dipus, subsp. of Periophthalmus dipus 212, 213, 214
dispar, Cyprinogobius 104
dispar, Gobius 104
dispar, Pseudogobius 104
dispar, Redigobius 104
dispar, Vaimosa 104
distigma, Eviota 317, 319
doriae, Brachygobius 194, 196
doriae, Gobius 194, 195
Doryptena 96
Doryptena okinawae 98, 100
douglasi, Gobius 7, 9
Drombus 52
Drombus halei 59, 60

Drombus tutuilae 100, 102
Drombus whitleyi 189
echinocephalus, Gobius 3, 4
echinocephalus, Paragobiodon 3, 4
edwardi, Apocryptodon 249
eigenmanni, Eleotris 293
elberti, Acentrogobius 53, 55
elegans, Gobius 71, 72, 73, 187, 188, 190
elegans, Microsicydium 236
elegans, Sicydium 235
elegans, Stiphodon 235, 236, 380
Eleotriodes 283, 332, 333
Eleotriodes cyanostigma 290, 291
Eleotriodes hasseltii 98
Eleotriodes helsdingenii 333, 335
Eleotriodes heteropterus 368
Eleotriodes longipinnis 333, 336
Eleotriodes microlepis 367
Eleotriodes muralis 333, 337, 338
Eleotriodes periophthalmus 341
Eleotriodes sexguttata 339, 341
Eleotriodes sexguttatus 333, 339, 340
Eleotriodes strigatus 333, 334, 338, 340
Eleotriodes taenionotopterus 327
eleotrioides, Gobius 163
Eleotris 283, 292, 293
Eleotris acanthopomus 297
Eleotris amboinensis 306, 308
Eleotris aporocephalus 347
Eleotris aporos 346, 349
Eleotris aporus 346
Eleotris aruensis 359, 361
Eleotris balia 299
Eleotris belobrancha 362, 363
Eleotris boddarti 259
Eleotris brachyurus 294
Eleotris butis 305, 308, 309, 310
Eleotris caledonicus 338, 339
Eleotris canarensis 350, 351
Eleotris canina 331
Eleotris cantherinus 299
Eleotris cantoris 343, 346
Eleotris caperatus (-a) 313, 314
Eleotris cavifrons 294, 295, 297
Eleotris compressa 391
Eleotris crescens 358, 359
Eleotris cyanostigma 290
Eleotris cyprinoides 326, 327, 328, 329
Eleotris dalyensis 351
Eleotris dasyrhynchus 314
Eleotris eigenmanni 293
Eleotris elongata 367, 368
Eleotris fimbriatus 359, 361
Eleotris fusca 292, 293, 294, 295, 297, 298, 300, 301
Eleotris fuscus 295
Eleotris gymnopomus 311
Eleotris gyrinoides 350, 351
Eleotris hasseltii 98, 100
Eleotris helsdingenii 335
Eleotris herwerdenii 350, 351, 352
Eleotris heterodon 358, 359
Eleotris heterolepis 323
Eleotris heteropterus 368
Eleotris hilgendorfi 392
Eleotris hoedtii 346, 347, 349
Eleotris humeralis 306
Eleotris ikeineur 336
Eleotris immaculatus 358
Eleotris incerta 294
Eleotris insulindica 293, 300
Eleotris isthmensis 297, 298, 299
Eleotris koilomatodon 313
Eleotris kuak 343
Eleotris lanceolata 248
Eleotris larapintae 374, 375
Eleotris laticeps 166, 167, 168
Eleotris leuciscus 325
Eleotris lineato-oculatus 338
Eleotris lineolatus 358
Eleotris litoralis 344
Eleotris longicauda 306, 308
Eleotris longipinnis 336
Eleotris macrocephalus 297, 299, 346
Eleotris macrodon 332
Eleotris macrolepidotus (-a) 346, 347
Eleotris macrolepis 293, 301
Eleotris maltzani 392
Eleotris margaritacea 343, 346
Eleotris marmorata 354, 355
Eleotris mauritianus 294
Eleotris melanopterus 306
Eleotris melanosoma 293, 297, 298, 299
Eleotris melanostigma 309
Eleotris melanotopterus 306
Eleotris melanurus 294
Eleotris mertoni 359, 361
Eleotris microlepis 367, 368
Eleotris miniatus 290, 291
Eleotris mogurnda 374, 375
Eleotris moncktoni 329
Eleotris muralis 337, 338

Eleotris nigra 294
Eleotris obscura 302
Eleotris ophicephalus 343
Eleotris ophiocephalus 343, 346, 347
Eleotris oxycephala 293, 299
Eleotris oxycephalus 299
Eleotris papa 306, 308
Eleotris periophthalmus 341
Eleotris pisonis 297
Eleotris pisonis fusca 295
Eleotris pisonis oxycephala 298, 299
Eleotris planiceps 347, 358
Eleotris poecilopterus 362
Eleotris porocephala (-us) 343, 344, 346
Eleotris porocephaloides 343
Eleotris prismatica 305
Eleotris pseudacanthopomus 294
Eleotris sandwicensis 294
Eleotris scintillans 343, 344
Eleotris sclateri 100
Eleotris selheimi 358
Eleotris semipunctata 290
Eleotris sexguttatus (-a) 339
Eleotris siamensis 355
Eleotris sinensis 286
Eleotris soaresi 294
Eleotris spec. 374
Eleotris squamifrons 391
Eleotris strigata 334, 336
Eleotris taenionotopterus 327
Eleotris taenioptera 362
Eleotris taeniura 336
Eleotris tolsoni 346
Eleotris trabeatus 338
Eleotris tumifrons 347
Eleotris urophthalmoides 295, 357, 359
Eleotris urophthalmus 355, 356
Eleotris viridis 343
Eleotris wardii 340
Eleotris wolffi 309
Ellerya 5
Ellerya unicolor 7, 9
Ellogobius 108
elongata, Eleotris 367, 368
ensifer, Asterropteryx 291
ensifer, Gladiogobius 32, 33
ensifera, Brachyeleotris 291
ensiferus, Asterropteryx 290, 291
epiphanes, Eviota 318
eruptionis, Amblyopus 272
eruptionis, Taenioides 270, 272
erythrinus, Gobius 44
erythrophaios, Gobiodon 10, 11
erythrophaios, Gobius 10
erythrospilus, Gobiodon 7, 8, 9
Euchoristopus 200
Euchoristopus kalolo regius 211
Euctenogobius cristatus 43, 45
Euctenogobius ophthalmonema 44, 45
Euctenogobius striatus 153
eugenius, Gobiomorphus 130
eugenius, Gobius 130
eugenius, Quisquilius 129, 130, 131
Eviota 283, 316, 317
Eviota abax abax 319
Eviota distigma 317, 319
Eviota epiphanes 318
Eviota gymnocephalus 316, 317, 318, 319
Eviota lachdeberei 317, 320
Eviota miniata 290
Eviota nigriventris 317, 320
Eviota prasites 317, 321
Eviota viridis 318
Eviota zonura 317, 318
Evorthodus catulus 188
extraneus, Sicyopterus 230, 231
Exyrias 52
Exyrias puntang 66
Exyrias puntangoides 66
fasciato-punctatus, Gobius 165, 168
fasciatus, Apocryptes 141, 142
fasciatus, Apocryptodon 141, 142
festivus, Gobius 179, 180
filamentosus, Gobius 188, 190
filifer, Cryptocentrus 79, 80, 86
filifer, Gobius 86, 87
fimbriatus, Eleotris 359, 361
fimbriatus, Oxyeleotris 354, 356, 359, 360, 361
flavescens, Gobius 122, 123, 124
flavidus, Gobius 188
flavipinnis, Stupidogobius 167
fontanesii, Cryptocentrus 81, 89, 90
fontanesii, Gobius 89, 91
fontanesii, Oxyurichthus 89
fragilis, Micrapocryptes 244
frenatus, Gobius 382
freycineti, subsp. of Periophthalmodon schlosseri 217, 218
freycineti, Periophthalmus 216
fuliag, Sicyopterus 227, 228

fulvescens, Mogurnda 347
fulvus, Gobiodon 8, 9
fusca, Eleotris 292, 293, 294, 295, 297, 298, 300, 301
fusca, subsp. of Eleotris pisonis 295
fusca, Poecilia 294
fusca, Vaimosa 125
fuscus, Bathygobius 184, 187, 188, 189
fuscus, Culius 294, 295
fuscus, Eleotris 295
fuscus, Gobius 187, 188, 189
fuscus, Mapo 188, 189
fusiformis, Gobius 165
Fusigobius 17, 146
Fusigobius labiatus 148
Fusigobius neophytus 146, 147
Galera 96
galwayi, Mugilogobius 119, 120
garra, Sicyopterus 223, 224
gastrospilos (-us), Gobius 117
gastrospilos (-us), Stigmatogobius 110, 117
gemmatus, Gobius 29
gemmeus, Gnatholepis 69, 70
geniornatus, Cryptocentrus 85, 86
genivittatus, Awaous 35
genivittatus, Chonophorus 35, 36
genivittatus, Gobius 35, 36, 37
genivittatus, Stenogobius 33, 34, 35, 36
geomys, Caragobius 268
Gergobius 333
gibbosus, Gobius 4
Gigantogobius 352
Gigantogobius jordani 354
Giuris 324
giuris, Glossogobius 162, 163, 165, 166, 167, 187
giuris, subsp. of Glossogobius giuris 167
giuris, Gobius 165, 166, 168
Gladiogobius 14, 32
Gladiogobius ensifer 32, 33
globiceps, Acentrogobius 54, 75, 76, 124, 392, 393
globiceps, Ctenogobius 75
Glossogobius 18, 161, 163, 174
Glossogobius aglestes 163, 164, 165
Glossogobius biocellatus 163, 164
Glossogobius campbellianus 116, 117
Glossogobius celebius 166, 167
Glossogobius circumspectus 166, 167
Glossogobius concavifrons 166, 167
Glossogobius giuris 162, 163, 165, 166, 167, 187
Glossogobius giuris brunneus 166
Glossogobius giuris giuris 167
Glossogobius intermedius 167
Glossogobius koragensis 166, 167, 168
Glossogobius matanensis 167
Glossogobius suppositus 166
Glossogobius tambujon 112
Glossogobius vaisiganus 163, 164, 165
Glossogobius vomer 166, 167, 168
glyphidodon, Apocryptes 254
glyphisodon, Apocryptes 254
glyphisodon, Apocryptodon 255, 256
Gnatholepis 18, 19, 168, 169
Gnatholepis anjerensis 169, 171
Gnatholepis baliurus 169
Gnatholepis calliurus 169, 170, 171
Gnatholepis canalae 66
Gnatholepis capistratus 69
Gnatholepis corletti 69, 70
Gnatholepis davaoensis 69
Gnatholepis deltoides 69
Gnatholepis gemmeus 69, 70
Gnatholepis hendersoni 68
Gnatholepis knighti 69, 70
Gnatholepis koumansi 61
Gnatholepis maculipinnis 66
Gnatholepis mingi 118
Gnatholepis puntang 66
Gnatholepis puntangoides 66
Gnatholepis sindonis 66, 68
Gnatholepis sternbergi 104
Gobiella 242
Gobiella birtwistlei 244
Gobiella pellucida 244
Gobiichthys 39
Gobiichthys microlepis 43
Gobiichthys papuensis 48
Gobiichthys tentacularis 44
Gobiodon 3, 5, 6, 13
Gobiodon atrangulatus 8, 9
Gobiodon ceramensis 10
Gobiodon citrinus 7, 8, 11
Gobiodon erythrophaios 10, 11
Gobiodon erythrospilus 7, 8, 9
Gobiodon fulvus 8, 9
gobiodon, Gobius 4
Gobiodon heterospilos 7, 12, 13
Gobiodon histrio 6, 7, 9

Gobiodon hypselopterus 11, 12
Gobiodon quinquestrigatus 6, 7, 8, 10, 11
Gobiodon rivulatus 10
Gobiodon verticalis 7, 8, 9
Gobioides anguillaris 273, 274
Gobioides anguilliformis 273
Gobioides buchanani 272
Gobioides caeculus 273
Gobioides cirratus 271
Gobioides ruber 277, 278
Gobioides rubicundus 275
Gobioides tenuis 391
Gobiomorphus cinctus 130
Gobiomorphus eugenius 130
Gobiomorphus illotus 102
Gobiomorphus sclateri 100
Gobiomorus taiboa 334
Gobiopsis oligactis 116, 117
Gobiopterus 220, 242
Gobiopterus brachypterus 242, 243
Gobiopterus chuno 242, 243, 244
Gobiopterus variegatus 242, 244
Gobiosoma 384
Gobiosoma guttulatum 264, 265
Gobiosoma insignum 20, 21
Gobiosoma pallida 383, 384
Gobiosoma punctularum 264, 265
Gobius 382
Gobius acutipennis 41, 44, 92, 93
Gobius acutipinnis 92, 93
Gobius aeolosoma 188, 190
Gobius albimaculatus 141
Gobius albomaculatus 141
Gobius albopunctatus 187, 188, 190
Gobius alcockii 194, 195
Gobius amadi 172
Gobius amiciensis 3, 4, 5
Gobius andamanensis 66
Gobius andrei 188
Gobius anguillaris 273
Gobius anjerensis 171
Gobius annulatus 141, 142
Gobius apogonius 111, 112
Gobius atripinnis 189, 190
Gobius baliuroides 235, 379, 380
Gobius baliurus 154, 169, 170
Gobius beauforti 35, 37
Gobius beccarii 381
Gobius belosso 46, 49
Gobius bicirrhosus 128, 129
Gobius biocellatus 163
Gobius bitelatus 29, 30
Gobius bleekeri 385
Gobius blokzeyli 35, 37
Gobius boddarti 259
Gobius bontii 54, 55
Gobius borneensis 127
Gobius boscii 166, 168
Gobius breviceps 187
Gobius brevifilis 178, 179, 180
Gobius brunneus 165, 187
Gobius buccatus 188
Gobius bynoensis 139, 140
Gobius calderae 72, 73
Gobius caledonicus 188, 190
Gobius canalae 66, 67
Gobius caninoides 31
Gobius caninus 61, 62, 63, 77
Gobius caninus var. africana 179
Gobius capistratus 68, 69
Gobius carolinensis 187
Gobius catebus 165
Gobius catulus 187
Gobius cauerensis 68, 69
Gobius cavifrons 157
Gobius celebius 165, 166, 168
Gobius ceramensis 10
Gobius changua 248
Gobius chilkensis 122
Gobius chlorostigma 56
Gobius chlorostigmatoides 58
Gobius chrysargus 88
Gobius chuno 244
Gobius circumspectus 166, 168
Gobius citrinus 11
Gobius cocosensis 187, 190
Gobius coelidotus 98, 100
Gobius concavifrons 166, 168
Gobius concolor 66, 67
Gobius cotticeps 185
Gobius criniger 178, 179, 180, 187
Gobius cristatus 43, 44
Gobius cyanoclavis 64, 65
Gobius cyanomos 64
Gobius cyanosmos 64
Gobius cyanotaenia 82, 88
Gobius cyclopterus 187, 189, 190
Gobius darnleyensis 188, 189, 190
Gobius decussatus 137, 138
Gobius deilus 143, 144
Gobius deltoides 69, 70

Gobius depressus 98, 100
Gobius dispar 104
Gobius doriae 194, 195
Gobius douglasi 7, 9
Gobius echinocephalus 3, 4
Gobius elegans 71, 72, 73, 187, 188, 190
Gobius eleotrioides 163
Gobius erythrinus 44
Gobius erythrophaios 10
Gobius eugenius 130
Gobius fasciato-punctatus 165, 168
Gobius festivus 179, 180
Gobius filamentosus 188, 190
Gobius filifer 86, 87
Gobius flavescens 122, 123, 124
Gobius flavidus 188
Gobius fontanesii 89, 91
Gobius frenatus 382
Gobius fuscus 187, 188, 189
Gobius fusiformis 165
Gobius gastrospilos (-us) 117
Gobius gemmatus 29
Gobius genivittatus 35, 36, 37
Gobius gibbosus 4
Gobius giuris 165, 166, 168
Gobius gobiodon 4
Gobius goldmanni 70
Gobius graeffii 188, 190
Gobius grammepomus 151, 153
Gobius grammepomus var. melanocephala 151
Gobius grandidieri 165
Gobius grandinosus 61, 63
Gobius gutum 165, 166
Gobius gymnauchen 380
Gobius gymnocephalus 91, 92
Gobius gymnopomus 34
Gobius harmandi 140, 141
Gobius hasseltii 226
Gobius hemigymnopomus 59
Gobius histrio 7, 8
Gobius hoevenii 125, 126
Gobius homocyanus 187, 190
Gobius hoplopomus 31
Gobius interstinctus 71, 73
Gobius janthinopterus 59
Gobius javanicus 119, 122, 123, 124, 166
Gobius johnstoniensis 122, 123
Gobius knighti 69
Gobius knutteli 86, 87
Gobius koelreuteri 207
Gobius kokius 165
Gobius kora 165
Gobius krefftii 187
Gobius kuhlii 378
Gobius kurpah 165
Gobius labiatus 148
Gobius labroides 139
Gobius lacertus 187
Gobius lacrymosus 35, 37
Gobius latifrons 156
Gobius leptochilus 77, 105
Gobius lineatus 187
Gobius litturatus 153
Gobius longimanus 41
Gobius macrurus 44
Gobius maculipinnis 66, 67
Gobius madagascariensis 380
Gobius mapo 187
Gobius marginalis 188, 189, 190
Gobius matanensis 166, 168
Gobius maxillaris 107
Gobius melanocephalus 151, 152, 153
Gobius melanopus 383
Gobius melanosoma 4
Gobius melanosticta (-us) 122, 124
Gobius melanostigma 92, 94
Gobius melanuros 191
Gobius melanurus 191
Gobius mertoni 159
Gobius microlepis 41, 43
Gobius modestus 379
Gobius modiglianii 382
Gobius mucosus 98
Gobius mystacinus 107
Gobius nebulopunctatus 187
Gobius nebulosus 178, 179
Gobius neilli 77, 78, 79
Gobius neophytus 146, 147
Gobius niger 205
Gobius nigripinnis 188, 189, 190
Gobius niveatus 84, 85
Gobius notacanthus 29
Gobius notonema 48, 49
Gobius notospilus 125, 126
Gobius nox 54, 187, 190
Gobius nunus 194
Gobius obscuripinnis 165
Gobius oligolepis 92, 93
Gobius olivaceus 165
Gobius ommaturus 27
Gobius ophthalmicus 188, 189, 190

Gobius ophthalmonema 44, 46
Gobius ophthalmoporus 35, 36, 37
Gobius ophthalmotaenia 68, 69
Gobius oplopomus 29
Gobius ornatus 71, 72
Gobius ornatus ornatus 72
Gobius oxypterus 245
Gobius oyensi 122
Gobius padangensis 187
Gobius panayensis 188, 189, 190
Gobius papilio 141
Gobius papuanus 87, 88
Gobius papuensis 46, 49
Gobius pasuruensis 92
Gobius pavo 165
Gobius pavoninoides 83, 84
Gobius pectinirostris 261
Gobius periphthalmoides 71
Gobius personatus 151, 153
Gobius petersenii 179
Gobius petrophilus 184, 185
Gobius petrophilus var. ocellata 184
Gobius phaiomelas 58
Gobius phaiosoma 165
Gobius phaiospilosoma 165
Gobius phalaena 141
Gobius platycephalus 165
Gobius pleurostigma 111
Gobius plinianus 259, 260
Gobius poecilichthys 188
Gobius poicilosoma 119
Gobius polycynodon 385
Gobius polynema 37, 38
Gobius polyophthalmus 88, 89
Gobius polyzona 35, 36, 37
Gobius pulverulentus 107
Gobius punctillatus 187
Gobius puntang 66
Gobius puntangoides 66
Gobius quinqueocellatus 141
Gobius quinquestrigatus 8, 10, 11
Gobius reichei 77, 78, 177
Gobius reticularis 120
Gobius rhombomaculatus 383
Gobius richardsonii 34
Gobius rivulatus 10
Gobius römeri 113, 115
Gobius rouxi 123, 124
Gobius russelii 165
Gobius russus 88, 89
Gobius sadanundio 111
Gobius sandvicensis 188
Gobius sarasinorum 158
Gobius sauroides 165
Gobius scabriceps 4
Gobius scapulopunctatus 186
Gobius schlosseri 216
Gobius sella 380
Gobius semicinctus 141
Gobius semidoliatus 149, 150
Gobius semifasciatus 149
Gobius septemradiatus 216
Gobius setosus 92, 94
Gobius sinensis 286
Gobius soporator 187, 190
Gobius spec. 32, 113, 188, 242
Gobius spectabilis 165, 168
Gobius sphinx 143
Gobius sphynx 143, 144
Gobius spilurus 92
Gobius stamineus 153, 154
Gobius stephensoni 72
Gobius sternbergi 104, 105
Gobius stethophthalmus 139
Gobius stigmatophorus 197, 199
Gobius stoliczkae 151
Gobius striatus 153, 154, 259
Gobius strigatus 334
Gobius sublitus 165, 168
Gobius sumatranus 163
Gobius suppositus 166
Gobius tambujon 112, 113
Gobius temminckii 92
Gobius tentacularis 44, 46
Gobius tesselata 123
Gobius tjilankahanensis 187
Gobius tredecemradiatus 218
Gobius triangularis 54, 55
Gobius unicolor 58, 59, 165, 168
Gobius uronema 44, 45, 46
Gobius vagina 277
Gobius variabilis 188, 189
Gobius venenatus 56, 57
Gobius ventralis 71
Gobius venustulus 71, 73
Gobius villosus 188, 189, 190
Gobius viridipunctatus 56, 57
Gobius viridis 263
Gobius voigtii 88, 89
Gobius waitei 4
Gobius watkinsoni 188, 189, 190
Gobius xanthosoma 4

Gobius xanthotaenia 88, 89
Gobius xanthozona 193
Gobius zelei 380
Gobius zurstrassenii 35
goldmanni, Acentrogobius 54, 70
goldmanni, Gobius 70
gracilis, Amblyopus 270, 271
gracilis, Ctenogobius 177, 178
gracilis, Periophthalmus 201, 210
graeffei, Aboma 188
graeffii, Gobius 188, 190
grammatogaster, Ctenogobius 177, 180, 391
grammepomus, Awaous 151, 152
grammepomus, Gobius 151, 153
grandidieri, Gobius 165
grandinosus, Gobius 61, 63
guamensis, Chonophorus 152
Guavina gyrinoides 350
Guavina immaculata 358
güntheri, Asterropteryx 326
güntheri, var. of Carassiops cyprinoides 326
güntheri, Hypseleotris 324, 325, 326
güntheri, var. of Ophiocara aporos 349
Gunnamatta 96
gutum, Gobius 165, 166
guttulatum, Gobiosoma 264, 265
gymnauchen, Gobius 380
gymnauchen, Microsicydium 224
gymnauchen, Sicydium 224, 225
gymnauchen, Sicyopterus 220, 221, 224, 225
gymnocephalus, Eviota 316, 317, 318, 319
gymnocephalus, Cryptocentrus 81, 91
gymnocephalus, Gobius 91, 92
gymnopomus, Butis 305, 311
gymnopomus, Eleotris 311
gymnopomus, Gobius 34
gymnopomus, Stenogobius 34, 35
Gymnurus 269
gyrinoides, Bunaka 350
gyrinoides, Eleotris 350, 351
gyrinoides, Guavina 350
hageni, Sicyopterus 221, 222
halei, Drombus 59, 60
hanae, Vireosa 365
harmandi, Gobius 140, 141
harmsi, Periophthalmus 201, 207
hasseltii, Callogobius 96, 98, 99
hasseltii, Eleotriodes 98
hasseltii, Eleotris 98, 100
hasseltii, Gobius 226
hasseltii, Valenciennea 98
hasseltii, Valenciennesia 98
Hazeus 168
helsdingenii, Eleotriodes 333, 335
helsdingenii, Eleotris 335
helsdingenii, Valenciennesia 335
Hemigobius 18, 191
Hemigobius bleekeri 191
hemigymnopomus, Gobius 59
hendersoni, Acentrogobius 54, 68
hendersoni, Gnatholepis 68
henlei, Apocryptes 251
henlei, Parapocryptes 251, 252
hermanni, Taenioides 273
hermannianus, Amblyopus 273, 274, 275
Herrea 96
herrei, Acentrogobius 53, 61
Herreogobius 17, 144
Herneogobius malekulae 145
herrmannianus, Taenioides 266
herwerdenii, Bunaka 350, 351
herwerdenii, Eleotris 350, 351, 352
herwerdenii, Oxyeleotris 352
heterodon, Eleotris 358, 359
heterodon, Oxyeleotris 358
heterolepidotus, Synechogobius 49
heterolepis, Eleotris 323
heterolepis, Pogoneleotris 322, 323
heteropterus, Eleotriodes 368
heteropterus, Eleotris 368
heteropterus, Ptereleotris 367, 368
heterospilos, Gobiodon 7, 12, 13
hilgendorfi, Eleotris 392
histophorus, Boleophthalmus 263
histophorus, Scartelaos 263
histrio, Gobiodon 6, 7, 9
histrio, Gobius 7, 8
hoedti, Ophiocara 346, 347
hoedtii, Eleotris 346, 347, 349
hoedtii, Ophiocara 344
hoedtii, var. of Ophiocara aporos 349
hoeveni, Vaimosa 125
hoevenii, Gobius 125, 126
hoevenii, Stigmatogobius 110, 125, 158
homocyanus, Gobius 187, 190
Hoplopomus 28
Hoplopomus acanthistius 29, 30

Hoplopomus canioides 29, 31
hoplopomus, Gobius 31
horiae, Vaimosa 113, 115
humeralis, Eleotris 306
Hypogymnogobius 192
Hypogymnogobius xanthozona 193
Hypseleotris 283, 324, 391
Hypseleotris agilis 347
Hypseleotris cyprinoides 325, 328
Hypseleotris güntheri 324, 325, 326
Hypseleotris leuciscus 325
Hypseleotris modestus 325, 326, 328, 329
Hypseleotris moncktoni 325, 329
Hypseleotris taenionotopterus 325, 327
hypselopterus, Gobiodon 11, 12
Ictiopogon 285
ikeineur, Eleotris 336
Illana 16, 128
Illana bicirrhosus (-a) 128
Illana cacabet 128, 129
illotus, Gobiomorphus 102
immaculata, Guavina 358
immaculatus, Eleotris 358
immeritus, Parvigobius 123, 124
inana, Bryanina 224, 225
incerta, Eleotris 294
inexplicatus, Smilogobius 23, 25, 26
inornatus, Amblygobius 136, 137
insignis, Amblygobius 197, 199
insignis, Cryptocentroides 197, 198
insignum, Gobiosoma 20, 21
insulindica, Eleotris 293, 300
insulindicus, Culius 300
intermedius, Brachyamblyopus 266, 269
intermedius, Glossogobius 167
intermedius, Trypauchenopsis 269
interstinctus, Gobius 71, 73
intonsa, Macgregorella 98, 100
Intonsagobius 14, 22
Intonsagobius kuderi 22
isognathus, Pseudogobius 115, 116
isognathus, Stigmatogobius 110, 115
isthmensis, Eleotris 297, 298, 299
Isthmogobius 168
Isthmogobius baliurus 170
Istigobius 72
jaarmani, Oxyurichthys 40, 41
jaarmanni, Oxyurichthus 40
janthinopterus, Acentrogobius 53, 59, 60
janthinopterus, Gobius 59
javanica, Vaimosa 123
javanicus, Gobius 119, 122, 123, 124, 166
javanicus, Pseudogobius 123
javanicus, Stigmatogobius 76, 110, 122, 123, 392, 393
johnstoniensis, Gobius 122, 123
jordani, Gigantogobius 354
jurongensis, Vaimosa 386
kabilia, Vaimosa 388
kalolo, Periophthalmus 208
kalolo, subsp. of Periophthalmus koelreuteri 208, 209
kampeni, Sicyopterus 231
karatunensis, Vaimosa 157
Kelloggella cardinalis 385
Kelloggella spec. 385
kerri, Paragobiodon 4, 5
knighti, Gnatholepis 69, 70
knighti, Gobius 69
knutteli, Cryptocentrus 86
knutteli, Gobius 86, 87
knutteli, Paragobius 86
koelreuteri, Gobius 207
koelreuteri, Periophthalmus 201, 203, 204, 207, 208, 210, 211, 213, 214
koelreuteri, var. or subsp. of Periophthalmus koelreuteri 208, 209
koilomatodon, Butis 313
koilomatodon, Eleotris 313
koilomatodon, Prionobutis 313, 314
kokius, Gobius 165
kora, Gobius 165
koragensis, Glossogobius 166, 167, 168
koumansi, Gnatholepis 61
koumansi, Vaimosa 113
kranjiensis, Ctenogobius 75
krefftii, Gobius 187
krefftii, Mapo 189
Krefftius 373
kuak, Eleotris 343
kuderi, Intonsagobius 22
kuhlii, Gobius 378
kurpah, Gobius 165
labiatus, Fusigobius 148
labiatus, Gobius 148
labroides, Gobius 139
lacertus, Gobius 187
lachdeberei, Eviota 317, 320
lachrymosus, Chonophorus 35, 36
lacrymosus, Gobius 35, 37
lacrymosus, Sicyopterus 232, 233
lacrymosus, Stenogobius 36

lacunicola, Ruppellia 4, 5
lanceolata, Eleotris 248
lanceolatus, Apocryptes 249
lanceolatus, Pseudapocryptes 247, 248, 249
laoe, Bathygobius 189
larapintae, Eleotris 374, 375
laterisquamatus, Oxyurichthus 51
laterisquamatus, Oxyurichthys 51
laterisquamatus, Paroxyurichthys 50, 51
laticeps, Chlamydes 185
laticeps, Eleotris 166, 167, 168
latifrons, Gobius 156
latifrons, Tamanka 155, 156
latifrons, Vaimosa 156
Leme 269
Leme mordax 271
leonis, Cryptocentrus 81
leptocephalus, Cryptocentrus 80, 85, 86
leptochilus, Acentrogobius 54, 76
leptochilus, Gobius 77, 105
Leptogobius 220, 245
Leptogobius oxypterus 245, 246
leuciscus, Asterropteryx 325
leuciscus, Eleotris 325
leuciscus, Hypseleotris 325
leucurus, Butis 308, 309
leytensis, Chlamydes 185
lineato-oculatus, Eleotris 338
lineatus, Apocryptes 139, 140, 141
lineatus, Gobius 187
lineolatus, Eleotris 358
lineolatus, Oxyeleotris 354, 358
linki, Amblygobius 136, 139
liolepis, Callogobius 96, 97, 98
liolepis, Cryptocentrus 80, 82
litoralis, Eleotris 344
litturatus, Gobius 153
Lizagobius 108
Lizettea 349
Lizettea pelewensis 350, 351
longicauda, Eleotris 306, 308
longifilis, Sicyopterus 222, 232, 233
longimanus, Gobius 41
longimanus, Oxyurichthys 40, 41, 42
longipinnis, Calleleotris 336
longipinnis, Eleotriodes 333, 336
longipinnis, Eleotris 336
longipinnis, Valenciennea 336
longipinnis, Valenciennesia 336
lophius, Cristatogobius 95
Lophogobius 384
Lophogobius bleekeri 384
Lophogobius chrysosoma 105, 106
Lophogobius wera 381
lungi, Rhinogobius 179
luzonica (-us), Biat 89, 90, 91
Macgregorella 96, 390, 391
Macgregorella badia 98, 100
Macgregorella bravoi 390
Macgregorella intonsa 98, 100
Macgregorella moroana 98, 100
Macgregorella santa 97, 98
macrocephalus, Culius 297
macrocephalus, Eleotris 297, 299, 346
macrochir, Pseudogobiodon 13
macrodon, Eleotris 332
macrodon, Odonteleotris 330, 331, 332
macrognathos, Vaimosa 113, 115
macrolepidotus (-a), Eleotris 346, 347
macrolepidotus, Ophiocara 344, 347
macrolepis, Apocryptes 251
macrolepis, Culius 301
macrolepis, Eleotris 293, 301
macrolepis, Parapocryptes 250, 251, 252
macrophthalmus, Apocryptes 263
macrophthalmus, Quisquilius 130, 132, 133
macrophthalmus, Scartelaos 263
macropterus, Awaous 151
macrostetholepis, Sicydium 228, 229
macrostetholepis, Sicyopterus 222, 228
macrurus, Gobius 44
maculipinnis, Gnatholepis 66
maculipinnis, Gobius 66, 67
maculata, Tamanka 157
madagascariensis, Gobius 380
madurensis, Apocryptes 254
madurensis, Apocryptodon 254, 255, 256
magnificus, Nemateleotris 369
magnisquamatus subsp. of Rhinogobius caninus 62
Mahidolia 106
Mahidolia normani 107
malaccensis, Periophthalmus 201, 205
malayanus, Quisquilius 130, 132
malcolmi, Apocryptodon 255, 256
malekulae, Ctenogobius 145
malekulae, Herreogobius 145
malekulae, Rhinogobius 145
malua, Boroda 358, 359
maltzani, Eleotris 392

Mapo 183
Mapo aeolosoma 189
Mapo crassiceps 188, 189, 190
Mapo fuscus 188, 189
mapo, Gobius 187
Mapo krefftii 189
Mapo marginalis 189
Mapo mearnsi 188, 189, 190
Mapo poecilichthys 188
margaritacea, Eleotris 343, 346
marginalis, Gobius 188, 189, 190
marginalis, Mapo 189
marmorata, Eleotris 354, 355
marmorata, Oxyeleotris 353, 354
marquesensis, Sicyopterus 231, 232
Mars 14, 21
Mars caeruleo-maculatus 21, 22
Mars caeruleo-punctatus 21
matanensis, Glossogobius 167
matanensis, Gobius 166, 168
mauritianus, Eleotris 294
maxillaris, Gobius 107
maxillaris, Waitea 107, 108
mayenna, Amblyopus 275
mearnsi, Bathygobius 189
mearnsi, Mapo 188, 189, 190
megacephalus, Chaenogobius 384
meggitti, Ctenogobius 189
melanobranchus, Rhinogobius 77, 78, 79
melanocephala, var. of Gobius grammepomus 151
melanocephala, Platyptera 376
melanocephalus, Awaous 152
melanocephalus, Chonophorus 152, 153
melanocephalus, Gobius 151, 152, 153
melanopterus, Butis 306
melanopterus, Eleotris 306
melanopus, Gobius 383
melanosoma, Culius 297, 298
melanosoma, Eleotris 293, 297, 298, 299
melanosoma, Gobius 4
melanosomus, Paragobiodon 4
melanosticta (-us), Gobius 122, 124
melanostigma, Butis 305, 309, 310
melanostigma, Eleotris 309
melanostigma, Gobius 92, 94
melanostigma, Stenogobius 92
melanotaeniatus, Periophthalmus 212
melanotopterus, Eleotris 306
melanuros, Gobius 191
melanurus, Eleotris 294
melanurus, Gobius 191
mertoni, Eleotris 359, 361
mertoni, Gobius 159
mertoni, var. of Oxyeleotris fimbriatus 361
mertoni, Tamanka 156, 159
Metagobius 96
Metagobius sclateri 102
Meuschenula 342
Meuschenula darwiniensis 344
Micrapocryptes 242
Micrapocryptes fragilis 244
microcephalus, Ctenotrypauchen 278, 282
microcephalus (-m), Sicydium 223
microcephalus, Sicyopterus 221, 223
microcephalus, Trypauchen 282
microcephalus, subsp. of Trypauchen vagina 282
Microgobius 108
microlepis, Eleotriodes 367
microlepis, Eleotris 367, 368
microlepis, Gobiichthys 43
microlepis, Gobius 41, 43
microlepis, Oxyurichthys 39, 40, 41, 43, 393
microlepis, Ptereleotris 367
microps, Pogoneleotris 315
microps, Prionobutis 312, 313, 315
Microsicydium 220, 235
Microsicydium elegans 236
Microsicydium gymnauchen 224
microstomia, Vaimosa 122, 123, 124
micrurus (-m), Sicydium 229
micrurus, Sicyopterus 222, 229, 230
mindanensis, Parapocryptes 48, 49, 250
mindanensis, Parapocryptes (Paenea-pocryptes) 250
mingi, Gnatholepis 118
mingi, Stigmatogobius 110, 118
miniata, Eviota 290
miniatus, Eleotris 290, 291
minutus, Periophthalmus 213, 214
Mirogobius 242
Mirogobius stellatus 242, 243
modestus, Asterropteryx 328
modestus, Gobius 379
modestus, Hypseleotris 325, 326, 328, 329
modestus, Periophthalmus 204
modiglianii, Gobius 382

Mogurnda 283, 373
Mogurnda aurifodinae 374
mogurnda, Eleotris 374, 375
Mogurnda fulvescens 347
Mogurnda mogurnda 374
mogurnda, Mogurnda 374
Mogurnda mogurnda adspersus 374, 376
Mogurnda mogurnda mogurnda 374, 376
mogurnda, subsp. of Mogurnda mogurnda 374, 376
Mogurnda obscura 302, 303
moloanus, Aparrius 54, 55
moloanus, Oligolepis 54
moncktoni, Eleotris 329
moncktoni, Hypseleotris 325, 329
montalbani, Apocryptodon 254, 255, 256
mordax, Leme 271
moroana, Macgregorella 98, 100
Mugil 394
Mugilogobius 155
Mugilogobius galwayi 119, 120
multifasciatus, Rhinogobius 180, 181, 182
multiradiatus, Brachyamblyopus 266, 267
multiradiatus, Pseudotrypauchen 267
Mucogobius 96
Mucogobius mucosus 98
Mucogobius sclateri 102
mucosus, Callogobius 98
mucosus, var. of Callogobius hasseltii 98
mucosus, Gobius 98
mucosus, Mucogobius 98
multisquamatus, Sicyopus 239, 241
muralis, Calleleotris 338
muralis, Eleotriodes 333, 337, 338
muralis, Eleotris 337, 338
muralis, Valenciennea 338
muralis, Valenciennesia 338
muscarum, Rhinogobius 146, 147
mystacina, Waitea 107, 108
mystacinus, Gobius 107
naraharae, Amblygobius 130, 131
naraharae, Cingulogobius 130
naraharae, Pleurogobius 130
nebulopunctatus, Gobius 187
nebulosus, Gobius 178, 179
nebulosus, Rhinogobius 179, 182
neglectus, Pseudogobius 113
neglectus, Stigmatogobius 113, 115
neilli, Gobius 77, 78, 79
Nemateleotris 283, 369
Nemateleotris magnificus 369
neophytus, Ctenogobius 146
neophytus, Fusigobius 146, 147
neophytus, Gobius 146, 147
neophytus, Rhinogobius 146
nesolepis, Odonteleotris 330
nesolepis, Odontoeleotris 330
niger, Culius 294
niger, Gobius 205
nigra, Eleotris 294
nigripinnis, Gobius 188, 189, 190
nigriventris, Eviota 317, 320
niveatus, Cryptocentrus 80, 84
niveatus, Gobius 84, 85
normani, Mahidolia 107
notacanthus, Centrogobius 29
notacanthus, Gobius 29
notacanthus, Oplopomus 29
notatus, subsp. of Periophthalmus vulgaris 211
notonema, Gobius 48, 49
notophthalmus, Ctenogobius 177, 181, 182
notospilus, Gobius 125, 126
novaeguineae, Boleophthalmus 264
novae guineae, var. of Oxyeleotris urophthalmus 354
novae-guineae, Rhiacichthys 376, 378
novae-guineaensis, subsp. of Periophthalmus cantonensis 201, 203, 204
nox, Bathygobius 189
nox, Gobius 54, 187, 190
nunus, Brachygobius 192, 193, 194, 197
nunus, Ctenogobius 194
nunus, Gobius 194
obscura, Eleotris 302
obscura, Mogurnda 302, 303
obscura (-us), Odontobutis 302, 303
obscuripinnis, Gobius 165
Obtortiophagus 52
ocellaris, Awaous 152, 153
ocellaris, Chonophorus 152
ocellata, var. of Gobius petrophilus 184
ocellicauda, Philypnus 286
oculo-mirus, Oxyurichthys 48, 49
ocyurus, Rhinogobius 93
Odontamblyopus 265

Odontamblyopus rubicundus 275, 276
Odonteleotris 283, 329, 330
Odonteleotris canina 330, 331
Odonteleotris macrodon 330, 331, 332
Odonteleotris nesolepis 330
Odontobutis 283, 302
Odontobutis obscura (-us) 302, 303
Odontoeleotris nesolepis 330
Odontogobius 135
Odontogobius phalaena 141
okinawae, Doryptena 98, 100
oligactis, Acentrogobius 53, 63
oligactis, Gobiopsis 116, 117
oligactis, Pseudogobiopsis 116
oligactis, Stigmatogobius 110, 116, 117
Oligolepis 15, 92
Oligolepis acutipennis 92, 93, 391
Oligolepis acutipinnis 93
oligolepis, Gobius 92, 93
Oligolepis moloanus 54
olivaceus, Brachyamblyopus 268, 269
olivaceus, Gobius 165
ommaturus, Acanthogobius 27
ommaturus, Actinogobius 27
ommaturus, Gobius 27
opalescens, Ctenogobius 183
ophicephalus, Eleotris 343
ophicephalus, Ophiocara 344
ophicephalus, Philypnus 286
Ophieleotris 342
Ophieleotris agilis 347
Ophieleotris aporos 347
Ophiocara 283, 342, 343
Ophiocara aporos 343, 346, 347
Ophiocara aporos var. aporos 349
Ophiocara aporos var. güntheri 349
Ophiocara aporos var. hoedtii 349
Ophiocara aporos rigonis 347, 349
Ophiocara aporus 346, 347
Ophiocara darwiniense (-is) 344
Ophiocara hoedti 346, 347
Ophiocara hoedtii 344
Ophiocara macrolepidotus 344, 347
Ophiocara ophicephalus 344
Ophiocara ophiocephalus 343
Ophiocara porocephala (-us) 343, 344
Ophiocara porocephala var. darwiniense 346, 349
ophiocephalus, Eleotris 343, 346, 347
ophiocephalus, Ophiocara 343
ophthalmicus, Gobius 188, 189, 190
ophthalmonema, Euctenogobius 44, 45
ophthalmonema, Gobius 44, 46
ophthalmonema, Oxyurichthys 44, 45
ophthalmonema, Pselaphias 44
ophthalmoporus, Gobius 35, 36, 37
ophthalmotaenia, Gobius 68, 69
Oplopomus 14, 28, 29
Oplopomus caninoides 29, 31, 32
oplopomus, Gobius 29
Oplopomus oplopomus 28, 29, 30
oplopomus, Oplopomus 28, 29, 30
Oplopomus notacanthus 29
Oplopomus pulcher 29
Oplopomus vergens 31, 32
Opua 52
oratai, Vaimosa 389
ornatus, Acentrogobius 29, 54, 71, 72
ornatus, Gobius 71, 72
ornatus, subsp. of Gobius ornatus 72
Orthostomus 283, 370
Orthostomus amblyopinus 370, 371
Ostreogobius 103
osgoodi, Vaimosa 113, 115
ouwensi, Sicyopterus 222, 226, 231, 232
oxycephala, Eleotris 293, 299
oxycephala, subsp. of Eleotris pisonis 298, 299
oxycephalus, Culius 299
oxycephalus, Eleotris 299
Oxyeleotris 283, 352, 353, 358
Oxyeleotris aruensis 359
Oxyeleotris boddarti 357
Oxyeleotris fimbriatus 354, 356, 359, 360, 361
Oxyeleotris fimbriatus var. mertoni 361
Oxyeleotris herwerdenii 352
Oxyeleotris heterodon 358
Oxyeleotris lineolatus 354, 358
Oxyeleotris marmorata 353, 354
Oxyeleotris urophthalmoides 353, 357, 358
Oxyeleotris urophthalmus 353, 355, 356, 359
Oxyeleotris urophthalmus var. novae guineae 354
Oxymetopon 283, 372
Oxymetopon typus 372, 373
oxypterus, Leptogobius 245, 246
Oxyurichthus 39
Oxyurichthus cristatus 43

Oxyurichthus fontanesii 89
Oxyurichthus jaarmanni 40
Oxyurichthus laterisquamatus 51
Oxyurichthus tentacularis 44
Oxyurichthys 15, 39, 40
Oxyurichthys amabilis 48, 49
Oxyurichthys auchenolepis 40, 49, 50
Oxyurichthys belosso 46
Oxyurichthys cornutus 45, 46
Oxyurichthys jaarmani 40, 41
Oxyurichthys laterisquamatus 51
Oxyurichthys longimanus 40, 41, 42
Oxyurichthys microlepis 39, 40, 41, 43, 393
Oxyurichthys oculo-mirus 48, 49
Oxyurichthys ophthalmonema 44, 45
Oxyurichthys papuensis 40, 46, 47, 48, 50, 250
Oxyurichthys rumbia 45
Oxyurichthys tentacularis 40, 44, 45
Oxyurichthys viridis 45, 46
Oxyurichthys visayanus 48, 49
oxypterus, Gobius 245
oyensi, Gobius 122
oyensi, Stigmatogobius 110, 122
pacifica, Cobitis 294
padangensis, Gobius 187
Paeneapocryptes 39
Paeneapocryptes, subg. of Parapocryptes 250
pallida, Gobiosoma 383, 384
panayensis, Gobius 188, 189, 190
panayensis, Sicyopterus 226, 234
Pandaka 16, 133
Pandaka pusilla 133, 134
Pandaka pygmaea 134, 135
papa, Eleotris 306, 308
papilio, Amblygobius 143
papilio, Gobius 141
papuanus, Amblygobius 87
papuanus, Cryptocentrus 80, 87
papuanus, Gobius 87, 88
papuensis, Cryptocentrus 87
papuensis, Gobiichthys 48
papuensis, Gobius 46, 49
papuensis, Oxyurichthys 40, 46, 47, 48, 50, 250
Parapocryptes 39, 147, 250
Parapocryptes cantonensis 251
Parapocryptes henlei 251, 252
Parapocryptes macrolepis 250, 251, 252
Parapocryptes mindanensis 48, 49, 250
Parapocryptes (Paeneapocryptes) mindanensis 250
Parachaeturichthys 15, 37
Parachaeturichthys polynema 37, 38
Paragobiodon 2, 3
Paragobiodon echinocephalus 3, 4
Paragobiodon kerri 4, 5
Paragobiodon melanosomus 4
Paragobiodon xanthosomus 4
Paragobius 79
Paragobius knutteli 86
Paroxyurichthys 15, 50
Paroxyurichthys laterisquamatus 50, 51
Paroxyurichthys typus 50, 51
Parioglossus 283, 363, 364
Parioglossus borneensis 363, 364
Parioglossus rainfordi 364
Parioglossus taeniatus 364
parvei, Sicydium 228
parvei, Sicyopterus 221, 228
parvida, Waitea 107
Parvigobius 108
Parvigobius immeritus 123, 124
parvus, subsp, of Periophthalmus dipus 213, 214
pasuruensis, Gobius 92
pavo, Gobius 165
pavoninoides, Cryptocentrus 80, 83, 84
pavoninoides, Gobius 83, 84
pectinirostris, Apocryptes 261
pectinirostris, Boleophthalmus 258, 261
pectinirostris, Gobius 261
pelewensis, Lizettea 350, 351
pelewensis, Stiphodon 236, 237
pellucida, Gobiella 244
penango, Pseudogobius 124
penango, Stigmatogobius 110, 124
Periophthalmodon 199, 215, 216
Periophthalmodon barbarus 216
Periophthalmodon schlosseri 215, 216, 217
Periophthalmodon schlosseri argentiventralis 217
Periophthalmodon schlosseri australis 217, 218
Periophthalmodon schlosseri freycineti 217, 218
Periophthalmodon schlosseri schlosseri 217
Periophthalmodon tredecemradiatus

216, 218
Periophthalmodon tredecemradiatus borneensis 219
Periophthalmodon tredecemradiatus tredecemradiatus 219
periophthalmoides, Gobius 71
Periophthalmus 199, 200
periophthalmus, Amblyeleotris 341
Periophthalmus argentilineatus 201, 210, 211, 214
Periophthalmus argentilineatus argentilineatus 215
Periophthalmus argentilineatus striopunctatus 215
Periophthalmus australis 216
Periophthalmus borneensis 218, 219
Periopththalmus cantonensis 204
Periophthalmus cantonensis cantonensis 204
Periophthalmus cantonensis novaeguineaensis 201, 203, 204
Periophthalmus chrysospilos 200, 201, 202, 203, 218
Periophthalmus dipus 201, 212, 213
Periophthalmus dipus angustiformis 211, 212, 213
Periophthalmus dipus dipus 212, 213, 214
Periophthalmus dipus parvus 213, 214
periophthalmus, Eleotriodes 341
periophthalmus, Eleotris 341
Periophthalmus freycineti 216
Periophthalmus gracilis 201, 210
Periophthalmus harmsi 201, 207
Periophthalmus kalolo 208
Periophthalmus koelreuteri 201, 203, 204, 207, 208, 210, 211, 213, 214
Periophthalmus koelreuteri albostriatus 208, 209
Periophthalmus koelreuteri var. argentilineatus 211
Periophthalmus koelreuteri kalolo 208, 209
Periophthalmus koelreuteri var. koelreuteri 208, 209
Periophthalmus koelreuteri velox 208, 209
Periophthalmus malaccensis 201, 205
Periophthalmus melanotaeniatus 212
Periophthalmus minutus 213, 214
Periophthalmus modestus 204
Periophthalmus ruber 216
Periophthalmus schlosseri 201, 216, 217, 218
Periophthalmus septemradiatus 216
Periophthalmus tredecemradiatus 218
Periophthalmus 13-radiatus 218
Periophthalmus variabilis 201, 205, 206
Periophthalmus variabilis sumatranus 206
Periophthalmus variabilis tidemani 206
Periophthalmus variabilis variabilis 206
Periophthalmus vulgaris 201, 210, 211, 212
Periophthalmus vulgaris ceylonensis 211, 212
Periophthalmus vulgaris notatus 211
Periophthalmus vulgaris vulgaris 211, 212, 213
Periophthalmus weberi 201
perpusillus, Amblygobius 137
perpusillus, Rhinogobius 137
personatus, Gobius 151, 153
petersenii, Gobius 179
petrophilus, Bathygobius 184
petrophilus, Gobius 184, 185
phaiomelas, Gobius 58
phaiosoma, Gobius 165
phaiospilosoma, Gobius 165
phalaena, Amblygobius 141, 142, 143
phalaena, Gobius 141
phalaena, Odontogobius 141
Philypnus ocellicauda 286
Philypnus ophicephalus 286
Philypnus sinensis 286
piapensis, Vaimosa 123, 124
pinguis, Bunaka 350, 351
pisonis, Eleotris 297
planiceps, Eleotris 347, 358
platycephalus, Callieleotris 354, 355
platycephalus, Gobius 165
Platyptera 376
Platyptera aspro 376, 378
Platyptera melanocephala 376
Platyptera sinensis 376
Platyptera trigonocephala 376
playfairi, Ptereleotris 367
Pleurogobius boulengeri 130
Pleurogobius naraharae 130
Pleurosicya 220, 237
Pleurosicya boldinghi 237
pleurostigma, Gobius 111

plinianus, Boleophthalmus 259
plinianus, Gobius 259, 260
Poecilia fusca 294
poecilichthys, Gobius 188
poecilichthys, Mapo 188
poecilopterus, Eleotris 362
Pogoneleotris 283, 323,
Pogoneleotris heterolepis 322, 323
Pogoneleotris microps 315
poicilosoma, Gobius 119
poicilosoma, Stigmatogobius 110, 119, 121, 123
polycynodon, Gobius 385
polycynodon, Sicyopus 385
polynema, Chaeturichthys 37
polynema, Gobius 37, 38
polynema, Parachaeturichthys 37, 38
polyophthalmus, Gobius 88, 89
polyzona, Gobius 35, 36, 37
porocephala (-us), Eleotris 343, 344, 346
porocephala (-us), Ophiocara 343, 344
porocephaloides, Eleotris 343
Porogobius 52
prasites, Eviota 317, 321
Prionobutis 283, 312
Prionobutis dasyrhynchus 313, 314
Prionobutis koilomatodon 313, 314
Prionobutis microps 312, 313, 315
Prionobutis serrifrons 313, 314
prismatica, Eleotris 305
prismaticus, Butis 304, 305
profundus, Quisquilius 130, 131
Pselaphias 39
Pselaphias ophthalmonema 44
pseudacanthopomus, Culius 294
pseudacanthopomus, Eleotris 294
Pseudapocryptes 246, 247
Pseudapocryptes borneensis 247, 248
Pseudapocryptes lanceolatus 247, 248, 249
Pseudapocryptes punctularum 264
Pseudogobiodon 3, 13
Pseudogobiodon citrinus 11
Pseudogobiodon macrochir 13
Pseudogobiodon verticalis 7, 9
Pseudogobiopsis 108
Pseudogobiopsis oligactis 116
Pseudogobiopsis römeri 113, 115
Pseudogobius 108
Pseudogobius bikolanus 105
Pseudogobius dispar 104
Pseudogobius isognathus 115, 116
Pseudogobius javanicus 123
Pseudogobius neglectus 113
Pseudogobius penango 124
Pseudotrypauchen 266
Pseudotrypauchen multiradiatus 267
Psilosomus 274
Ptereleotris 283, 366, 367
Ptereleotris heteropterus 367, 368
Ptereleotris microlepis 367
Ptereleotris playfairi 367
pulcher, Oplopomus 29
pulverulentus, Gobius 107
punctatus, Apocryptodon 255
punctillatus, Gobius 187
punctularum, Gobiosoma 264, 265
punctularum, Pseudapocryptes 264
puntang, Acentrogobius 54, 66
puntang, Exyrias 66
puntang, Gnatholepis 66
puntang, Gobius 66
puntangoides, Awaous 66
puntangoides, Exyrias 66
puntangoides, Gnatholepis 66
puntangoides, Gobius 66
pusilla, Pandaka 133, 134
pygmaea, Pandaka 134, 135
quinqueocellatus, Gobius 141
quinquestrigatus, Gobiodon 6, 7, 8, 10, 11
quinquestrigatus, Gobius 8, 10, 11
Quisquilius 16, 17, 32, 129, 130
Quisquilius eugenius 129, 130, 131
Quisquilius macrophthalmus 130, 132, 133
Quisquilius malayanus 130, 132
Quisquilius profundus 130, 131
quoyi, Belobranchus 362
raha, Trypauchen 277, 279
rainfordi, Parioglossus 364
Redigobius 16, 19, 103, 104
Redigobius chrysosoma 77, 104, 105
Redigobius dispar 104
Redigobius sternbergi 104
regius, subsp. of Euchoristopus kalolo 211
reichei, Acentrogobius 54, 77, 177, 380
reichei, Ctenogobius 77
reichei, Gobius 77, 78, 177
reticularis, Gobius 120

reticularis, Stigmatogobius 110, 120
Rhiacichthys aspro 376, 377
Rhiacichthys novae-guineae 376, 378
Rhinogobius atribranchiostegus 77, 79
Rhinogobius atripinnatus 58, 59
Rhinogobius baliuroides 77, 179, 380
Rhinogobius calderae 72
Rhinogobius caninus 62
Rhinogobius caninus magnisquamatus 62
Rhinogobius circumspectus 166
Rhinogobius corallinus 188, 189, 190
Rhinogobius criniger 179, 180
Rhinogobius decoratus 74
Rhinogobius lungi 179
Rhinogobius malekulae 145
Rhinogobius melanobranchus 77, 78, 79
Rhinogobius multifasciatus 180, 181, 182
Rhinogobius muscarum 146, 147
Rhinogobius nebulosus 179, 182
Rhinogobius neophytus 146
Rhinogobius ocyurus 93
Rhinogobius perpusillus 137
Rhinogobius scapulopunctatus 186
Rhinogobius similans 62, 63
Rhinogobius similis 62, 63
Rhinogobius suluensis 180, 391
Rhinogobius umbra 62
Rhinogobius viridi-punctatus 56, 58
rhombomaculatus, Gobius 383
Rhyacichthys 376
Rhyacichthys aspro 376, 377
richardsonii, Gobius 34
Rictugobius 106
rigonis, subsp. of Ophiocara aporos 347, 349
rivulatus, Gobiodon 10
rivulatus, Gobius 10
römeri, Gobius 113, 115
römeri, Pseudogobiopsis 113, 115
römeri, Stigmatogobius 110, 113, 114, 115
rouxi, Gobius 123, 124
ruber, Periophthalmus 216
ruber, Gobioides 277, 278
rubicundus, Amblyopus 275
rubicundus, Gobioides 275
rubicundus, Odontamblyopus 275, 276
rubicundus, Taenioides 275
rubropunctatus, Cryptocentrus 85, 86
rumbia, Oxyurichthys 45
Rupellia 3
Ruppelia 3
Ruppellia lacunicola 4, 5
russelii, Gobius 165
russus, Cryptocentrus 81, 88
russus, Gobius 88, 89
sadanundio, Gobius 111
sadanundio, Stigmatogobius 109, 111
sandvicensis, Gobius 188
sandwicensis, Eleotris 294
santa, Macgregorella 97, 98
sarasinorum, Gobius 158
sarasinorum, Tamanka 156, 158
sauroides, Gobius 165
scabriceps, Gobius 4
scapulopunctatus, Bathygobius 184, 186
scapulopunctatus, Ctenogobius 186
scapulopunctatus, Gobius 186
scapulopunctatus, Rhinogobius 186
Scartelaos 257, 262
Scartelaos histophorus 263
Scartelaos macrophthalmus 263
Scartelaos viridis 263, 264
Schismatogobius 14, 19
Schismatogobius bruynisi 20, 21
schlosseri, Gobius 216
schlosseri, Periophthalmodon 215, 216, 217
schlosseri, Periophthalmus 201, 216, 217, 218
schlosseri, subsp. of Periophthalmodon schlosseri 217
scintillans, Eleotris 343, 344
sclateri, Batracheleotris 102
sclateri, Callogobius 97, 100, 102
sclateri, Eleotris 100
sclateri, Gobiomorphus 100
sclateri, Metagobius 102
sclateri, Mucogobius 102
sculptus, Boleophthalmus 258, 259
sealei, Apocryptodon 254, 255, 256
selheimi, Eleotris 358
sella, Gobius 380
semicinctus, Amblygobius 141, 143
semicinctus, subsp. of Amblygobius semicinctus 142
semicinctus, Gobius 141
semidoliatus, Gobius 149, 150
semidoliatus, Zonogobius 131, 149
semifasciatus, Gobius 149

semipunctata, Eleotris 290
semipunctatus, Asterropterix 290
semipunctatus, Asterropteryx 289, 290, 291
semoni, Stiphodon 236, 237
septemradiatus, Gobius 216
septemradiatus, Periophthalmus 216
serangoonensis, Vaimosa 119, 120
Sericagobioides 274
serrifrons, Butis 313
serrifrons, Prionobutis 313, 314
setiger, Sicydium 226, 228
setosus, Gobius 92, 94
sexguttata, Eleotriodes 339, 341
sexguttata, Valenciennesia 339
sexguttatus, Eleotriodes 333, 339, 340
sexguttatus (-a), Eleotris 339
siamensis, Eleotris 355
siamensis, Vaimosa 116, 117
Sicydiops 220
Sicydiops xanthurus 234
Sicydium balinense 240
Sicydium cynocephalum 226, 228
Sicydium elegans 235
Sicydium gymnauchen 224, 225
Sicydium macrostetholepis 228, 229
Sicydium microcephalus (-m) 223
Sicydium micrurus (-m) 229
Sicydium parvei 228
Sicydium setiger 226, 228
Sicydium taeniurum 229
Sicydium wichmanni 226, 231, 232
Sicydium xanthurus (-m) 234
Sicydium zosterophorum 239
Sicyopterus 219, 220, 221, 225, 235, 394
Sicyopterus brevis 222, 233
Sicyopterus crassus 226, 227, 228
Sicyopterus cynocephalus 221, 226. 232
Sicyopterus extraneus 230, 231
Sicyopterus fuliag 227, 228
Sicyopterus garra 223, 224
Sicyopterus gymnauchen 220, 221, 224, 225
Sicyopterus hageni 221, 222
Sicyopterus kampeni 231
Sicyopterus lacrymosus 232, 233
Sicyopterus longifilis 222, 232, 233
Sicyopterus macrostetholepis 222, 228
Sicyopterus marquesensis 231, 232
Sicyopterus microcephalus 221, 223
Sicyopterus micrurus 222, 229, 230
Sicyopterus ouwensi 222, 226, 231, 232
Sicyopterus panayensis 226, 234
Sicyopterus parvei 221, 228
Sicyopterus taeniurus 230
Sicyopterus tauae 224, 225
Sicyopterus wichmanni 221, 226
Sicyopterus xanthurus 222, 234
Sicyopterus zurstrasseni 231
Sicyopus 220, 238, 239
Sicyopus balinense 220, 239
Sicyopus multisquamatus 239, 241
Sicyopus polycynodon 385
Sicyopus zosterophorum 238, 239
siitensis, Tamanka 156, 160
similans, Rhinogobius 62, 63
similis, Rhinogobius 62, 63
sindonis, Gnatholepis 66, 68
sinensis, Bostrichthys 285, 286
sinensis, Bostrychus 286
sinensis, Eleotris 286
sinensis, Gobius 286
sinensis, Philypnus 286
sinensis, Platyptera 376
sinensis, Tamanka 125, 126
singapurensis, Smilogobius 23, 24, 26, 27
singapurensis, Stigmatogobius 127
sinicus, Boleophthalmus 263
Smilogobius 14, 23
Smilogobius cinctus 23, 25, 26
Smilogobius inexplicatus 23, 25, 26
Smilogobius singapurensis 23, 24, 26, 27
smithi, Boleophthalmus 249
snelliusi, Callogobius 97, 102
soaresi, Eleotris 294
soporator, Gobius 187, 190
spectabilis, Gobius 165, 168
sphinx, Gobius 143
sphynx, Amblygobius 136, 143
sphynx, Gobius 143, 144
spilopleura, Vaimosa 111
spilopterus, Acentrogobius 64, 65
spilurus, Gobius 92
squamifrons, Eleotris 391
stamineus, Awaous 151, 153, 170
stellatus, Mirogobius 242, 243
stamineus, Gobius 153, 154
Stenogobius 15, 19, 33, 34
Stenogobius acutipinnis 93
Stenogobius genivittatus 33, 34, 35, 36

Stenogobius gymnopomus 34, 35
Stenogobius lacrymosus 36
Stenogobius melanostigma 92
stephensoni, Gobius (Istigobius) 72
sternbergi, Gnatholepis 104
sternbergi, Gobius 104, 105
sternbergi, Redigobius 104
stethophthalmus, Gobius 139
stevensoni, Vailima 236, 237
sticta, Bunaka 350
Stigmatogobius 16, 18, 19, 76, 108, 109, 115, 196, 381, 394
Stigmatogobius amblyrhynchus 76, 110, 121
Stigmatogobius borneensis 110, 127
Stigmatogobius gastrospilos (-us) 110, 117
Stigmatogobius hoevenii 110, 125, 158
Stigmatogobius isognathus 110, 115
Stigmatogobius javanicus 76, 110, 122, 123, 392, 393
Stigmatogobius mingi 110, 118
Stigmatogobius neglectus 113, 115
Stigmatogobius oligactis 110, 116, 117
Stigmatogobius oyensi 110, 122
Stigmatogobius penango 110, 124
Stigmatogobius poicilosoma 110, 119, 121, 123
Stigmatogobius reticularis 110, 120
Stigmatogobius römeri 110, 113, 114, 115
Stigmatogobius sadanundio 109, 111
Stigmatogobius singapurensis 127
Stigmatogobius tambujon 110, 112
stigmatophorus, Cryptocentrus 197
stigmatophorus, Gobius 197, 199
Stiphodon 219, 235
Stiphodon elegans 235, 236, 380
Stiphodon pelewensis 236, 237
Stiphodon semoni 236, 237
stoliczkae, Gobius 151
Stomogobius 370
striatus, Euctenogobius 153
striatus, Gobius 153, 154, 259
strigata, Calleleotris 334
strigata, Eleotris 334, 336
strigata (-us), Valenciennea 334
strigata, Valenciennesia 334
strigatus, Eleotriodes 333, 334, 338, 340
strigatus, Gobius 334
strigogenys, Bostrichthys 285, 287
strigogenys, Bostrychus 287
striopunctatus, subsp. of Periophthalmus argentilineatus 215
Stupidogobius 161
Stupidogobius flavipinnis 167
sua, Brachygobius 194
sua, Thaigobiella 194
sublitus, Gobius 165, 168
suluensis, Rhinogobius 180, 391
sumatranus, Amblyopus 271
sumatranus, Gobius 163
sumatranus, subsp. of Periophthalmus variabilis 206
sumatrensis, Trypauchenichthys 280, 281
suppositus, Glossogobius 166
suppositus, Gobius 166
Synechogobius heterolepidotus 49
taenia, Amblyopus 275, 276
taenia, Trypauchen 277, 279, 280
taeniatus, Parioglossus 364
Taenioides 265, 269, 270, 272, 391
Taenioides abbotti 275, 276
Taenioides anguillaris 270
Taenioides anotus 268
Taenioides buchanani 270, 272
Taenioides caeculus 271, 273
Taenioides cirratus 270, 271, 272
Taenioides coecus 268
Taenioides eruptionis 270, 272
Taenioides gracilis cirratus 271
Taenioides hermanni 273
Taenioides herrmannianus 266
Taenioides rubicundus 275
Taenioides spec. 268, 275
taenionotopterus, Asterropteryx 327
taenionopterus, Eleotriodes 327
taenionotopterus, Eleotris 327
taenionotopterus, Hypseleotris 325, 327
taenioptera, Eleotris 362
taeniopterus, Belobranchus 362
taeniura, Calleleotris 336
taeniura, Eleotris 336
taeniurum, Sicydium 229
taeniurus, Sicyopterus 230
tagala, Tamanka 156, 160
taiboa, Gobiomorus 334
Tamanka 18, 19, 154, 155, 174
Tamanka cavifrons 155, 156, 157
Tamanka latifrons 155, 156
Tamanka maculata 157

Tamanka mertoni 156, 159
Tamanka sarasinorum 156, 158
Tamanka siitensis 156, 160
Tamanka sinensis 125, 126
Tamanka tagala 156, 160
Tamanka ubinensis 155, 156, 157
tambujon, Glossogobius 112
tambujon, Gobius 112, 113
tambujon, Stigmatogobius 110, 112
tauae, Sicyopterus 224, 225
taylori, Apocryptodon 255, 256
taylori, Boleophthalmus 249, 250
temminckii, Gobius 92
tentacularis, Gobiichthys 44
tentacularis, Gobius 44, 46
tentacularis, Oxyurichthus 44
tentacularis, Oxyurichthys 40, 44, 45
tenuis, Gobioides 391
tesselata, Gobius 123
tesselata, Vaimosa 123, 124
Thaigobiella 192
Thaigobiella sua 194
tidemani, subsp. of Periophthalmus variabilis 206
tjilankahanensis, Gobius 187
tolsoni, Eleotris 346
trabeatus, Eleotris 338
tredecemradiatus, Gobius 218
tredecemradiatus, Periophthalmodon 216, 218
tredecemradiatus, subsp. of Periophthalmodon tredecemradiatus 219
tredecemradiatus, Periophthalmus 218
13 radiatus, Periophthalmus 218
triangularis, Ctenogobius 54
triangularis, Gobius 54, 55
Trichopharynx 150
trigonocephala, Platyptera 376
Trypauchen 276, 277
Trypauchen microcephalus 282
Trypauchen raha 277, 279
Trypauchen vagina 277, 278, 279, 282, 391
Trypauchen vagina microcephalus 282
Trypauchen vagina vagina 278
Trypauchen taenia 277, 279, 280
Trypauchenichthys 276, 280, 391
Trypauchenichthys sumatrensis 280, 281
Trypauchenichthys typus 280, 281, 282
Trypauchenophrys 266
Trypauchenopsis 266
Trypauchenopsis intermedius 269
tumifrons, Eleotris 347
tutuilae, Drombus 100, 102
typus, Oxymetopon 372, 373
typus, Paroxyurichthys 50, 51
typus, Trypauchenichthys 280, 281, 282
ubinensis, Tamanka 155, 156, 157
Ulcigobius 96
umbra, Rhinogobius 62
umbra, Vaimosa 62, 63
unicolor, Ellerya 7, 9
unicolor, Gobius 58, 59, 165, 168
urolepis, Amblyopus 268, 269
urolepis, Brachyamblyopus 266, 267, 268
uronema, Gobius 44, 45, 46
urophthalmoides, Eleotris 295, 357, 359
urophthalmoides, Oxyeleotris 353, 357, 358
urophthalmus, Eleotris 355, 356
urophthalmus, Oxyeleotris 353, 355, 356, 359
vagina, Gobius 277
vagina, Trypauchen 277, 278, 279, 282, 391
vagina, subsp. of Trypauchen vagina 278
Vailima 235
Vailima stevensoni 236, 237
Vaimosa 108, 155
Vaimosa avicennia 386
Vaimosa balteata 73
Vaimosa bikolana 105, 106
Vaimosa brocki 113, 115
Vaimosa cagayanensis 156
Vaimosa chulae 125
Vaimosa dispar 104
Vaimosa fusca 125
Vaimosa hoeveni 125
Vaimosa horiae 113, 115
Vaimosa javanica 123
Vaimosa jurongensis 386
Vaimosa kabilia 388
Vaimosa karatunensis 157
Vaimosa koumansi 113
Vaimosa latifrons 156
Vaimosa macrognathos 113, 115
Vaimosa microstomia 122, 123, 124
Vaimosa oratai 389
Vaimosa osgoodi 113, 115

Vaimosa piapensis 123, 124
Vaimosa serangoonensis 119, 120
Vaimosa siamensis 116, 117
Vaimosa spilopleura 111
Vaimosa tesselata 123, 124
Vaimosa umbra 62, 63
Vaimosa zebra 125
vaisiganus, Glossogobius 163, 164, 165
Valenciennea 332
Valenciennea aruensis 338, 339
Valenciennea hasseltii 98
Valenciennea longipinnis 336
Valenciennea muralis 338
Valenciennea strigata (-us) 334
Valenciennea violifera 339, 340, 341
Valenciennesia 333
Valenciennesia hasseltii 98
Valenciennesia helsdingenii 335
Valenciennesia muralis 338
Valenciennesia sexguttata 339
Valenciennesia strigata 334
validus, Creisson 59, 60
variabilis, Gobius 188, 189
variabilis, Periophthalmus 201, 205, 206
variabilis, subsp. of Periophthalmus variabilis 206
variegatus, Apocryptes 244
variegatus, Gobiopterus 242, 244
velox, subsp. of Periophthalmus koelreuteri 208, 209
venenatus, Gobius 56, 57
ventralis, Gobius 71
venustulus, Gobius 71, 73
venustus, Cryptocentrus 83, 84
vergens, Oplopomus 31, 32
verticalis, Gobiodon 7, 8, 9
verticalis, Pseudogobiodon 7, 9
villosus, Gobius 188, 189, 190
violifera, Valenciennea 339, 340, 341
Vireosa 283, 364
Vireosa hanae 365
viridipunctatus, Acentrogobius 53, 56
viridipunctatus, Gobius 56, 57
viridi-punctatus, Rhinogobius 56, 58
viridis, Allogobius 317
viridis, Boleophthalmus 263, 264
viridis, Eleotris 343
viridis, Eviota 318
viridis, Gobius 263
viridis, Oxyurichthys 45, 46
viridis, Scartelaos 263, 264
visayanus, Oxyurichthys 48, 49
voighti, Cryptocentrus 88
voigtii, Gobius 88, 89
vomer, Glossogobius 166, 167, 168
vulgaris, Periophthalmus 201, 210, 211, 212
vulgaris subsp. of Periophthalmus vulgaris 211, 212, 213
waigiensis, Ctenogobius 54, 55
Waitea 16, 106
Waitea maxillaris 107, 108
Waitea mystacina 107, 108
Waitea parvida 107
waitei, Gobius 4
wardii, Eleotris 340
watkinsoni, Gobius 188, 189, 190
weberi, Periophthalmus 201
Weberogobius 18, 172
Weberogobius amadi 172, 173
wera, Lophogobius 381
whitleyi, Drombus 189
wichmanni, Sicydium 226, 231, 232
wichmanni, Sicyopterus 221, 226
wirzi, Apocryptodon 254, 256
wolffi, Eleotris 309
xanthomelas, Brachygobius 194, 195
xanthosoma, Gobius 4
xanthosomus, Paragobiodon 4
xanthotaenia, Gobius 88, 89
xanthozona, Brachygobius 193, 194
xanthozona, Gobius 193
xanthozona, Hypogymnogobius 193
xanthurus, Sicydiops 234
xanthurus (-m), Sicydium 234
xanthurus, Sicyopterus 222, 234
Yongeichthys 176
Yongeichthys criniger 179
zebra, Vaimosa 125
zelei, Gobius 380
zonatus, Bostrichthys 286, 288
zonatus, Bostrychus 288
Zonogobius 17, 131, 148
Zonogobius boreus 149, 150
Zonogobius semidoliatus 131, 149
zonura, Eviota 317, 318
zosterophorum, Sicydium 239
zosterophorum, Sicyopus 238, 239
zurstrassenii, Gobius 35
zurstrasseni, Sicyopterus 231

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS